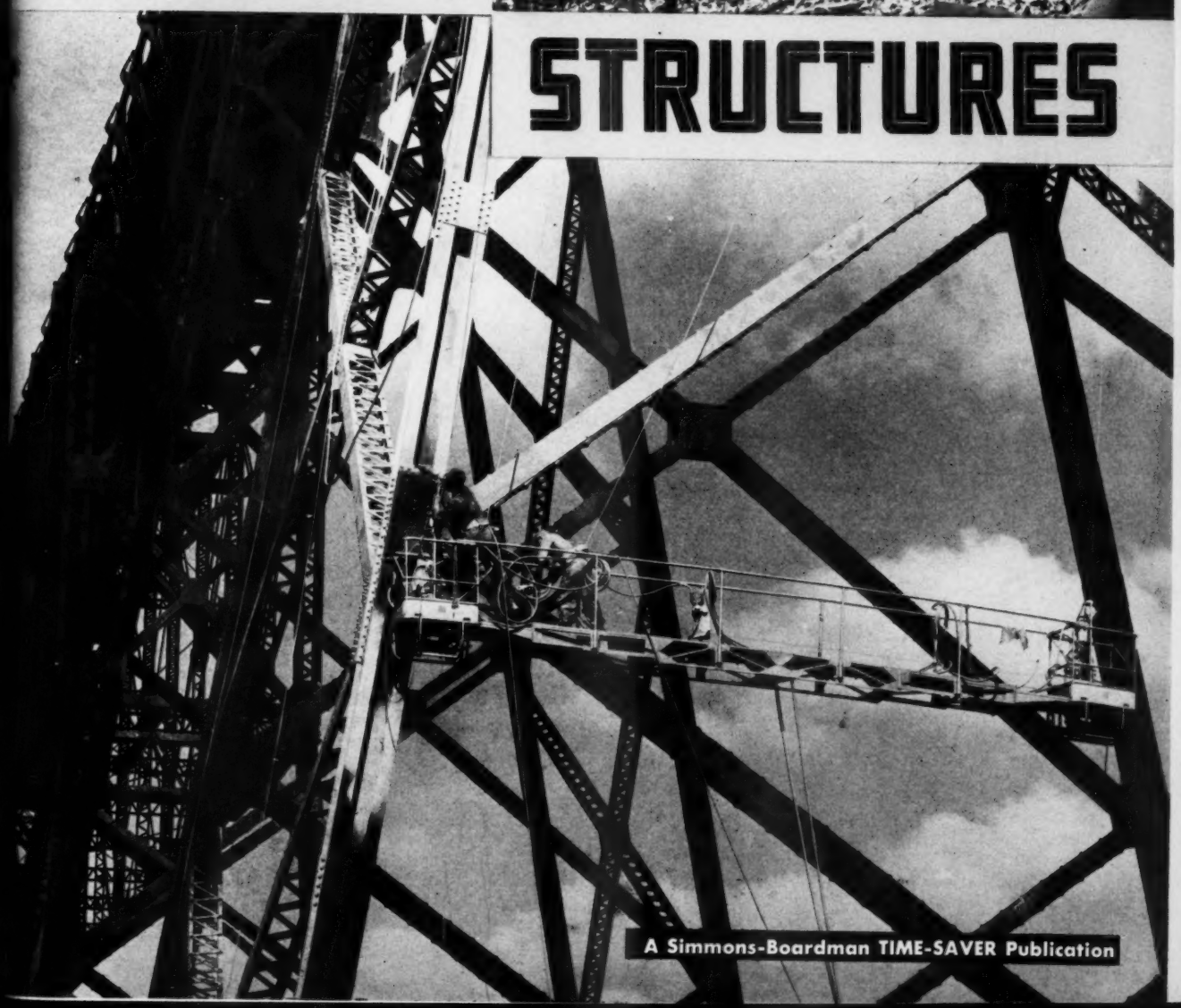
CIAL REPORT
North Western's
RMULA FOR EFFICIENCY

January 1959

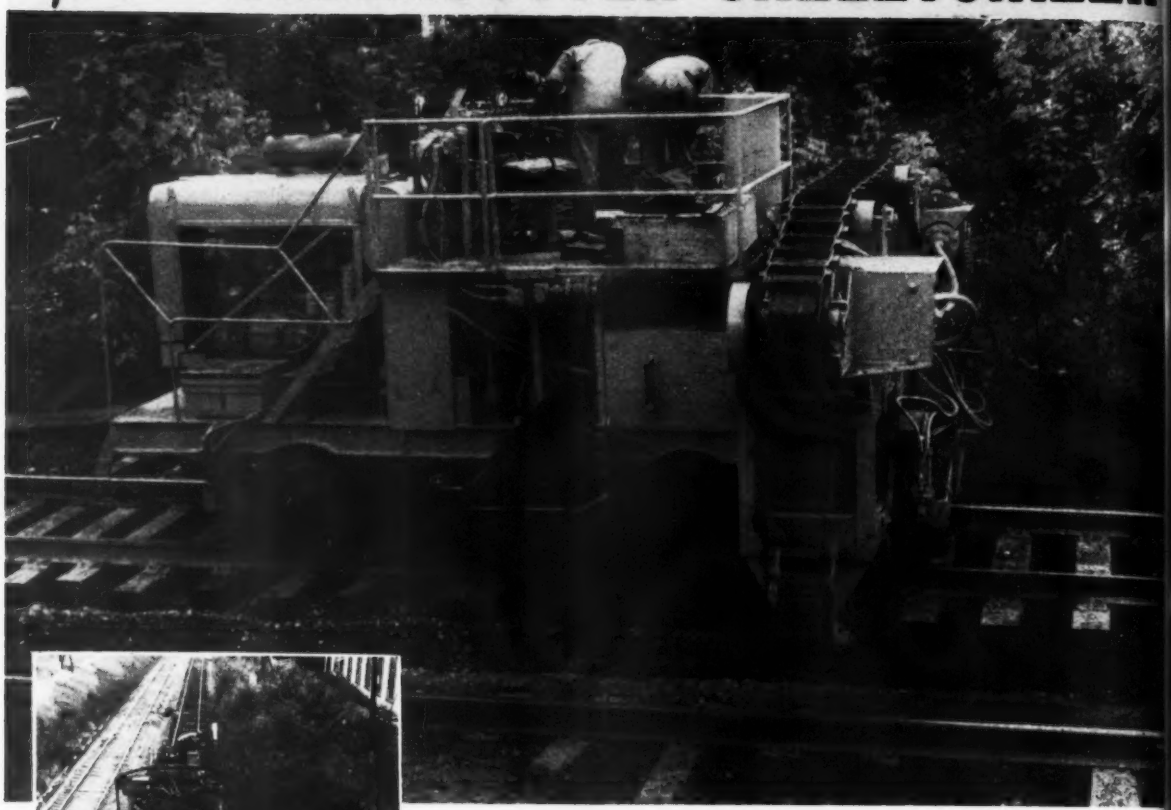
way TRACK and

STRUCTURES



A Simmons-Boardman TIME-SAVER Publication

The Kershaw UNDERCUTTER-SKELETONIZER



LOWERS TRACK on the CHICAGO & NORTHWESTERN

The Chicago & Northwestern is one of the progressive railroads which utilizes the Kershaw Undercutter & Skeletonizer, as well as other Kershaw machines.

If you have a problem with track clearance at overhead bridges, station yards, tunnels or other locations, lower your track with the Kershaw Undercutter & Skeletonizer. The machine, which is available on either an outright purchase or a lease plan, lowers track as much as six inches at one pass, and does so without disturbing tie alignment. Clearance for double track is maintained at all times, and traffic actually can be passed on the lowered track with out resurfacing, thereby eliminating detours.

KERSHAW
MANUFACTURING CO. INC.
MONTGOMERY ALABAMA.

Heat-treated Rails Star on the Lackawanna

Here is one of many formidable curves on the "Route of Phoebe Snow" through Pennsylvania's Pocono Mountains. At this point, the curve is 8 degrees 30 minutes, the grade about 1.6 pct, and the superelevation is 6½ in. Length of curve is approximately 3000 ft. Quite an ordeal for the rails when a heavy drag thunders through!

With this in mind, the Lackawanna in 1953 laid standard control-cooled rails on the westbound track (right), and Bethlehem heat-treated control-cooled rails on both high and low sides of the eastbound track.

When the above photograph was taken last November, one of the railroad's engineers observed that the standard rails would have to be replaced this Spring, while the heat-treated rails looked good for several more years of service. Even allowing for the higher initial cost of heat-treated rails, the Lackawanna thus stands to realize a substantial saving at this installation.

Not surprising to us at Bethlehem, of course. We have been in on quite a number of similar cases on major railroads across the land. We see a shining future for heat-treated rails, and for the roads that use them. We shall welcome the opportunity to look into this future with you. Just get in touch with our nearest office, or drop us a line at the address below.

BETHLEHEM STEEL COMPANY
BETHLEHEM PA.

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BETHLEHEM STEEL

BETHLEHEM STEEL

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SIMAZINE* 50W

pre-emergence residual herbicide with 7 SAFETY FEATURES

saves railroads time, labor, materials and money

New Geigy Simazine 50W herbicide with the 7 safety features makes possible preventive weed control for railroads—with resultant savings in time, labor, and money.

Simazine 50W herbicide kills both grassy and broadleaf weeds before or shortly after emergence. Its effective residual action gives railroads long-time weed control.

At the rate of 20 lbs. per acre, one pre-emergence application of Simazine 50W controls most annual broadleaf weeds and grasses for an entire season. For longer residual control, or for control of more resistant perennials, use 30 to 40 lbs. per acre.

This year, plan to take care of your weed-control problem early—before growth appears. Remember, Geigy Technical Service is always available to assist you. Write for the name of your nearest distributor. Address Dept. RS-19.

CHECK THESE SIMAZINE 50W SAFETY FEATURES

1. **SAFETY TO HUMANS AND ANIMALS.** Extremely low toxicity.
2. **SAFETY TO ADJACENT VEGETATION.** Minimum lateral leaching.
3. **SAFETY TO SPRAYING EQUIPMENT.** Non-corrosive or abrasive to equipment.
4. **SAFETY NEAR ELECTRICITY.** Relatively low electrical conductivity.
5. **SAFETY FROM DRIFT HAZARD.** Works thru roots—little or no toxicity to foliage.
6. **SAFETY FROM FIRE HAZARD.** Non-flammable.
7. **SAFETY FOR USE ON VALUABLE LAND.** Not a permanent soil sterilent.

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Saw Mill River Road, Ardsley, N. Y.

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in this issue:

vol. 55, no. 1 JANUARY, 1959

SPECIAL REPORT ON THE C&NW

A formula for efficiency 23
Management encourages, inspires 24
Top officers add ideas, know-how 25
For the track—More strength and durability 26
Set work goals and check progress 28
Big changes set stage for mechanization 30
Tie renewals, surfacing are highly mechanized 32
Hike rail-gang output 35
Machines, better planning spark up B&B forces 36
Grading and ditching programs 38
Keeps bridges in good repair 43
Low maintenance is goal for buildings 44
Year 'round work on work-equipment fleet 48
Signal forces meet new challenge 52
Communications expanded, modernized 54
Coping with snow and ice 64

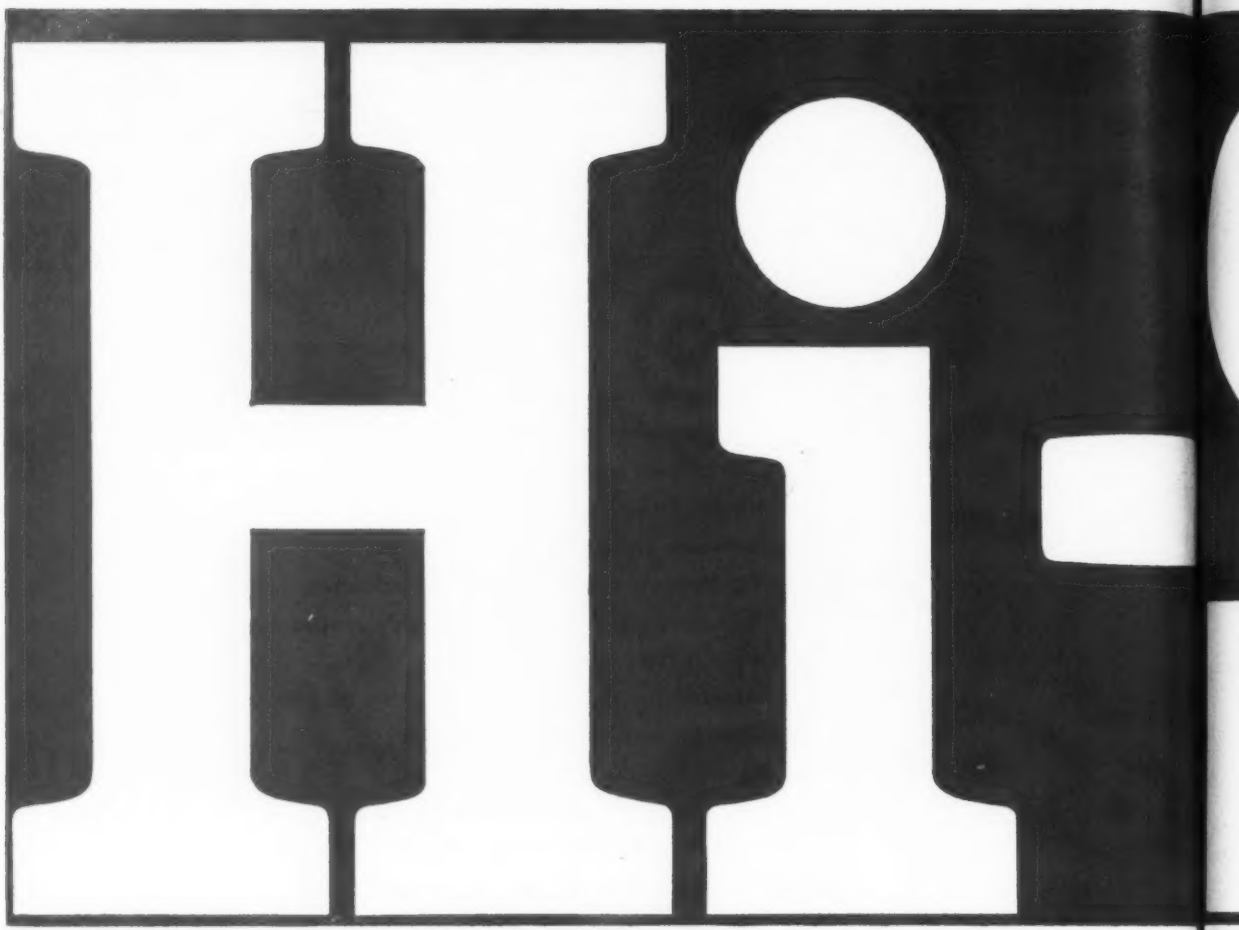
DEPARTMENTS

Manufacturers' helps 9
News about people 10
Biographical briefs 10
Dear reader 14
News notes 19
News briefs in pictures 56
Products 58
Association news 72
Supply trade news 74

DON'T MISS . . .

When the Central of Georgia switched to the cycle method of renewing ties and surfacing track it was faced with the problem of how to spot surface track economically between out-of-face surfacings. The answer: Use mechanical spot tampers.

. . . in the February issue



for better rail performance...

Recognizing the desirability of developing a rail affording greater resistance to shelling and curve wear, CF&I and Western Railroads have cooperated in verifying the relative merits of High Silicon Rail versus Carbon Steel Rail.

Reports appearing in AREA Proceedings and comparison of contours taken of rails in test installations under varied climatic, traffic and track

conditions, have confirmed the logical and practical summary to the effect that High Silicon Rail will afford 50 to 100% better performance than Standard Carbon Rail.

The Railroad Sales Department will be glad to furnish a new folder covering details of CF&I Hi-Si® Rail Development and Records of Performance.

CF&I

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DENVER, COLORADO

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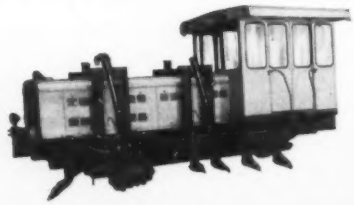
FAIRMONT

Does more jobs in ballast maintenance

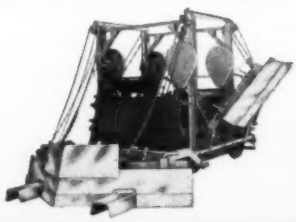
One man—and a Fairmont W23 Series A Ballast Maintenance Car can efficiently perform these five necessary ballast operations. A *center plow* evenly distributes ballast between rails and from shoulder to shoulder. Rugged *scarifiers* loosen packed shoulder ballast, remove mud dams, extend tie life. Sturdy *discs* break up clods, kill weeds, greatly improve drainage. The *track brush* keeps tie top surfaces clear of debris, fills depressions between ties. *Ballast boxes* shape, level and equalize shoulder ballast.

You'll find the Fairmont W23 Series A Car is more economical, too! The machine is of heavy and durable construction . . . provides hydraulic control for all tools and attachments. One-man operation shaves labor costs to a minimum. And since one machine does five essential jobs, capital outlay for equipment is substantially reduced. Be ready for spring! Contact your Fairmont representative now for further details on modernizing and mechanizing your ballast maintenance operations.

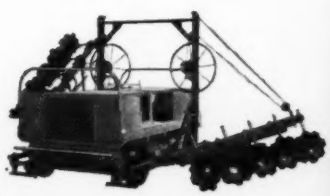
W77 SERIES A BALLAST MAINTENANCE CAR can work two tools on each side at the same time for high daily mileage.

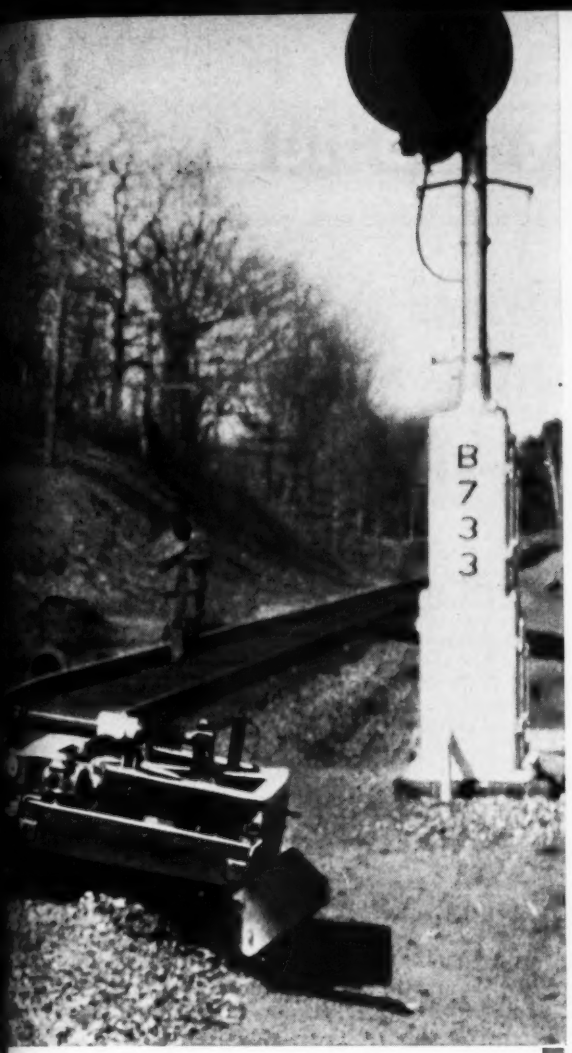


W92 SERIES B BALLAST BLADER AND SHAPER spreads and distributes ballast when surfacing. An economical unit that needs only one operator.



W62 SERIES C BALLAST DISCER uses a three-man crew, improves track drainage and appearance, uproots weeds, reshapes shoulders.





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LEADER

FOR HALF A CENTURY

Fairmont ballast maintenance equipment has a better in-service record—costs less to maintain.

Fairmont

RAILWAY MOTORS, INCORPORATED

FAIRMONT, MINNESOTA

Helps from Manufacturers

The following compilation of literature—including pamphlets and data sheets—is offered free to railroad men by manufacturers to the railroad industry. To receive the desired information, write direct to the manufacturer.

TRACK MACHINERY. The new 1959 Jackson Track Maintainer is described in detail in a six-page brochure now available. The two-color folder points out the versatility and efficiency of the machine and the advantages it affords for both production tamping and track maintaining. The machine and its applications are described and illustrated and general specifications are included. Specifications are also given for the optional spot tamping jack assembly that can be factory-applied to the 1959 model as well as a conversion kit which allows the assembly to be applied to 1957 or earlier models. (Write: *Jackson Vibrators, Inc., Dept. RTS, Ludington, Mich.*)

DRAINAGE PRODUCTS. A new condensed catalog is available which shows the manufacturer's drainage and construction products for industrial uses. The 12-page catalog, Gen-10658, illustrates and describes the Armco line of corrugated metal pipe and pipe-arch; Multi-plate pipe, pipe-arch and arch; perforated pipe; water control gates; Flex-beam guardrail; liner plates; bin-type retaining walls and steel sheeting. Data on available sizes and allowable loadings are included. (Write: *Armco Drainage & Metal Products, Inc., Product Information Service, Dept, RTS, Middletown, Ohio.*)

RUST DATA. A pamphlet is available which lists the different rates at which metal rusts in various parts of the country. The rust index includes rates for each of 523 cities throughout the United States. Rates vary from three to fifteen years. (Write: *Rust-Oleum Corporation, Dept. RTS, 2799 Oakton St., Evanston, Ill.*)

TESTING SERVICES. Bulletin 5801 describes the complete line of laboratory and field testing facilities and services available from the company. The six-page bulletin gives detailed descriptions, with illustrations, of its engineering facilities and services from environmental studies to instrumental calibration, reliability testing and failure analysis. Also included are descriptions of the company's chemical laboratory, and its facilities for materials testing, engineering inspection and certification of product quality. (Write: *United States Testing Company, Dept. RTS, 1415 Park Ave., Hoboken, N. J.*)

AIR MOTORS. A new bulletin, Form 5072A, is available which shows over one hundred Ingersoll-Rand air motors. The two-color, 16-page bulletin describes and illustrates both multi-vane and piston motors in a power range from 0.3 to 24 hp with speeds running from 50 to 2580 rpm at rated horsepower. Complete specifications and dimension drawings are included along with cut-away photographs that show the design and construction features of the motors. Eight illustrated case histories show typical applications in industry. A typical air motor power curve is given as well as information on remote-control operation of the motors. (Write: *Ingersoll-Rand, Dept. RTS, 11 Broadway, New York 4, N. Y.*)

CAR-SHAKING EQUIPMENT. Bulletin 658 describes and illustrates two models of the "Carquake" hydraulically-powered car shakers for unloading hopper-bottom railroad cars—the Type B stationary-mounted model and the Type C rail-mounted model. Pointed out are the unique features of the design and operation of the shakers. A drawing of each model is included showing dimensions and other data required for engineering purposes. Also pictured are the manufacturer's bulk-materials handling equipment showing the numbers of the descriptive bulletins available. (Write: *Stephens-Adamson Manufacturing Company, Engineering Division, Dept RTS, Ridgeway Ave., Aurora, Ill.*)

CHAIN SAWS. Two new Hoffco chain saws are featured in a bulletin now available. Literature 3083 describes and illustrates the Super 88 direct-drive and the Super 645 vari-speed chain saws. Features of the saws are described, some in considerable detail. A brief description of the attachments and accessories available are included. The Hoffco Heavy-Duty Brushcutter and attachments are also described and illustrated. (Write: *Hoffco, Inc., Dept. RTS, Richmond, Ind.*)

News about people

BOSTON & MAINE—Lawrence B. Boyd, assistant to engineer of structures at Boston, has been promoted to assistant engineer of structures there, succeeding **Everett A. Armington,** assistant structural engineer, who has retired. Mr. Boyd's former position has been abolished.

CANADIAN PACIFIC—T. J. Boyle, has been appointed assistant engineer of bridges at Montreal, Que., succeeding **J. M. Bentham,** who has been appointed engineer of track.

COLORADO & SOUTHERN—FORT WORTH & DENVER—E. A. Graham has been appointed assistant chief engineer with headquarters at Denver, Colo., succeeding **W. S. Broome,** retired.

COTTON BELT—J. R. Leguenec, division engineer at Tyler, Tex., retired effective January 1.

DENVER & RIO GRANDE WESTERN—W. H. Freeman, engineer of track, has taken a leave of absence to become chief engineer of the National Railroad of Venezuela.

ELGIN, JOLIET & EASTERN—S. H. Shepley, chief engineer, has been promoted to general superintendent, with headquarters as before at Joliet, Ill. **A. C. Johnson,** assistant chief engineer, has been promoted to chief engineer to replace Mr. Shepley, and **R. F. Beck,** system engineer of planning and development, becomes assistant chief engineer to succeed Mr. Johnson.

ERIE—Charles W. Traister has been appointed grade crossing engineer, succeeding **Samuel B. Gill,** who has been appointed principal assistant engineer. **John J. Tibbits,** has been appointed office engineer, succeeding **Walter O. Boessneck,** retired.

FERROCARRIL DEL PACIFICO — Robert A. Sharood, who for the past three years has been resident engineer for Coverdale & Colpitts on the rehabilitation of this road (Pacific Railway of Mexico), has been transferred to the New York office of Coverdale & Colpitts, effective January 1.

FRISCO—J. O. Elliott, roadmaster at Ft. Smith, Ark., has been promoted to assistant division engineer at Ft. Scott, Kans., succeeding **R. N. Schmidt** who has been transferred to Chaffee, Mo. Mr. Schmidt succeeds **R. D. White,** who has been promoted to division engineer of the Central division at Ft. Smith, Ark. **T. J. Pigg** has been appointed assistant roadmaster on the Southwestern division-north at Tulsa, Okla., succeeding **L. A. Thomas** who has been promoted to roadmaster on the Northern division at Ft. Scott, Kans. Mr. Thomas succeeds L. F. Woodlock who has been transferred to the Central division at Hugo, Okla., succeeding **L. E. Hobbs,** transferred to Ft. Smith.

R. H. Beeder
Santa Fe

J. E. Eisemann
Santa Fe

GULF, COLORADO & SANTE FE—Jurisdiction of **R. O. Nutt,** district engineer at Galveston, Tex., has been extended to include the duties of the division engineer of the Gulf division, succeeding **T. D. Mason,** transferred.

ILLINOIS CENTRAL—J. H. Stevens, general foreman track at Mattoon, Ill., has been appointed acting supervisor track at Bloomington, Ind., succeeding **G. G. Phillips,** who has been appointed acting supervisor bridges and buildings at Champaign, Ill. Mr. Phillips succeeds **W. L. Hawkey** who is away due to illness.

KANSAS CITY SOUTHERN—S. L. Smith has been appointed bridge engineer with headquarters at Kansas City, Mo., succeeding **R. R. Crosby,** retired.

PENNSYLVANIA—Glenn S. Lehman, supervisor track at Newport, Pa., has been promoted to assistant district engineer at Canton, Ohio, succeeding **Max K. Clark** who has been promoted to district engineer there.

ROCK ISLAND—H. B. Christianson, Jr., assistant chief engineer at Chicago, has been promoted to assistant to the operating vice-president there, succeeding **Oscar R. Swanson,** retired.

SANTA FE—Rudolph H. Beeder, assistant chief engineer at Chicago, has been promoted to chief engineer, system, with the same headquarters, succeeding **Thomas A. Blair,** whose retirement was announced in the December issue. **R. E. Knapp,** division engineer at Pueblo, Colo., has been promoted to district engineer of the Southern district at Amarillo, Tex., succeeding **J. E. Eisemann** who has been promoted to chief engineer of the Western Lines with the same headquarters. Mr. Eisemann succeeds **J. A. Noble,** retired.

SOUTHERN PACIFIC—O. G. Linde, assistant division engineer of the Northwestern Pacific at San Rafael, Calif., has been appointed assistant division engineer on the Southern Pacific at Los Angeles, succeeding **Russell E. Frame** who has been promoted to division engineer at Ogden, Utah.

Obituary

David P. Bibb, 64, assistant valuation engineer of the Louisville & Nashville, died December 3 at Louisville, Ky.

Henry C. Crosand, retired assistant chief engineer of the Denver & Rio Grande Western, died on October 25.

Biographical briefs

Rudolph H. Beeder, 53, who was recently promoted to chief engineer, system, of the Santa Fe at Chicago (announced elsewhere in this issue), was born at Mobile, Ala., and attended the University of Michigan. He entered the service of the Santa Fe in 1920 as a carman helper, La Junta, Colo. Shortly after that he was transferred to the engineering department where he served as signalman helper, draftsman, chainman, rodman and transitman. In 1935 he became construction—water service foreman on the Western Lines. In 1939, he was appointed general foreman bridges and buildings at Slaton, Tex., and in 1940 he was appointed general water service foreman on the Western Lines. Mr. Beeder was promoted to division engineer at Emporia, Kans., in September 1943 and to district engineer at Topeka, Kans., in May 1948. He was promoted to assistant to chief engineer, system, at Chicago, in November 1949 and to assistant chief engineer, system, at the same location in May 1953, the position he was holding at the time of his recent promotion.

Thomas A. Blair, 66, who recently retired as chief engineer of the Santa Fe at Chicago (*RT&S,* Dec., p. 10), was born in DeBeque, Colo., and was graduated from the University of Colorado in 1913 with a Bachelor of Science degree in civil engineering. He entered the service of the Santa Fe as a rodman at La Junta, Colo., in 1915 after a tenure at his alma mater as an instructor in civil engineering. He was advanced to transitman and then to office engineer. During World War I he served as a first lieutenant with the 115th engineers in the AEF. After the war he joined the Wyoming Highway Department as a resident engineer at Sheridan. In 1920 he returned to the Santa Fe as a building inspector and was advanced to roadmaster in 1925. Mr. Blair served as division engineer from 1927 to 1930 when he was appointed to assistant engineer in charge of construction. In 1936 he was appointed trainmaster and the following year he was advanced to district engineer. He was promoted to chief engineer, Western Lines, at Amarillo, Tex., in 1938 and to assistant chief engineer, system, at Chicago in 1943. In 1948 he was promoted to chief engineer, system, at the same location, the position he held at the time of his recent retirement.

R. G. Maughan, 37, who was recently promoted to assistant chief engineer of the Grand Trunk Western at Detroit, Mich. (*RT&S,* Nov., p. 10), was born at Toronto, Ont., and graduated from the University of Toronto with a Bachelor of Science degree in civil engineering. Mr. Maughan started his railroad career with the Canadian National in November 1945 as a structural designer in the Central Region bridge en-

(Continued on page 66)

now it's easier to Destroy Weeds...

with ready-to-use, easy-to-apply

EFFECTIVE...ECONOMICAL

UREABOR®

WEED and GRASS KILLER

Here's your thriftier, easier way to stop weeds! Look in that hand and you'll see enough UREABOR to kill vegetation in a 12 sq. ft. area! Consider the convenience and economy this can mean to you. Consider, too, that a UREABOR "kill" remains effective for a season or longer. And UREABOR has important safety features; it is *nonflammable, nonpoisonous* when used as directed, and *does not corrode* ferrous metals. Protect your timber structures, yards and buildings from fire-hazardous weeds by applying UREABOR weed killer now... it's easier to apply!

Nothing to mix... no water to haul

One easy application—dry—may keep ground weed-free for a season or longer!

This special spreader for UREABOR makes application fast and easy...

The PCB Spreader applies UREABOR to best advantage, at prescribed low rates. It holds enough UREABOR to treat up to 2500 sq. ft. without refilling—weighs a mere 6 lbs.

Write today for complete information!

AGRICULTURAL SALES DEPARTMENT

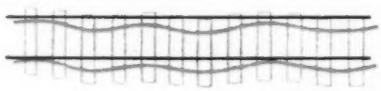
United States Borax & Chemical Corporation

PACIFIC COAST BORAX COMPANY DIVISION

630 SHATTO PLACE, LOS ANGELES 5, CALIFORNIA

. . . the story behind the

NORDBERG Smoothin' OPERATION



The SMOOTHIN' team is made up of a Nordberg Trak-Surfacer with shortened wire (50′0″), Tamping Power Jack, Gang Tamper, Line Indicator, and Trakliner. Gang personnel consists of three machine operators, a man for marking ties to be tamped, and a foreman.

HOW IT WORKS: Propelled by the Tamping Power Jack, the Trak-Surfacer, adapted for SMOOTHIN', is moved along the track until a low spot is encountered in either or both rails. Sighting is done by wire and low spots are indicated by movement of pointers on the Power Jack. The operator then moves the Jack to the nearest joint, center or quarter, raises the tie to correct the low spot by bringing the pointer to zero on the scale and then tamps the tie.

Following behind the Trak-Surfacer a man indicates, by code, the ties to be tamped and whether the ties must be tamped on one or both ends. Then, the Gang Tamper tamps the ties.

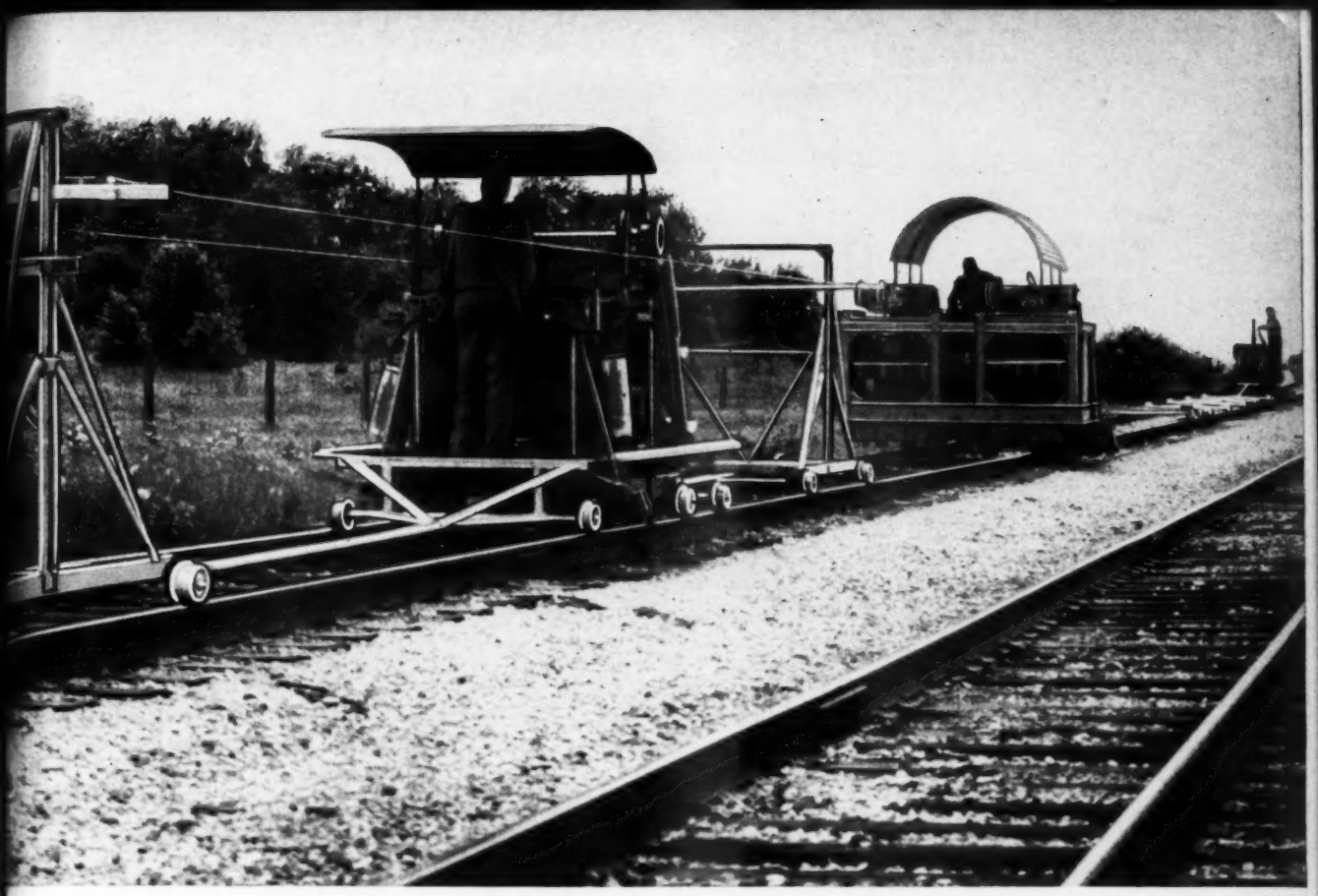
Tangent track is then lined with the Trakliner and Line Indicator. The foreman supervises the overall SMOOTHIN' operation and assists in the lining of curves.

On a recent demonstration, 473 rail lengths of track (approximately 3½ miles) were smoothed in 14 working hours, in which 46% of the ties were tamped.

Call or write for further information on this latest use of Nordberg *"Mechanical Muscles."*

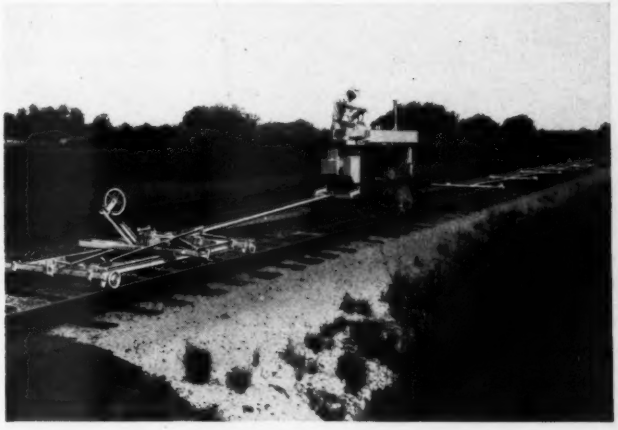
Cost-Cutting Nordberg "Mechanical Muscles" Include:

BALLAST ROUTER • BANTAM RAIL SLOTTER • CRIBEX® • BALLASTEX® • SCREENEX® • SPIKE HAMMER • TIE DRILL • HYDRAULIC and MECHANICAL SPIKE PULLERS • POWER JACK • POWER WRENCH • RAIL DRILL • RAIL GRINDERS • SURF-RAIL® GRINDER • TIE-KAT® • TRAKLINER® • TRACKSHIFTER • DUN-RITE® GAGING MACHINE and BRONCO • DSL® YARD CLEANER • GANDY® TIE PULLER and INSERTER • GANG TAMPER • SELF-PROPELLED ADZER • SELF-PROPELLED SPIKE PULLER • TAMPING POWER JACK • TRAK-SURFACER • LINE INDICATOR



Over-all view of a SMOOTHIN' operation showing the Nordberg Trak-Surfacer, Tamping Power Jack team, Gang Tamper, Line Indicator and Trakliner.

Close-up view of the Nordberg Gang Tamper, with split tamping heads.



View of the Nordberg Trakliner and Line Indicator used for lining the track.

NORDBERG MFG. CO., Milwaukee 1, Wisconsin

Write For LEASING Plans

R758-R

NORDBERG

Mechanical Muscles®

Dear reader:

RAILWAY
TRACK and STRUCTURES

Where do we stand on deferred maintenance?

On every railroad today there is urgent need for an answer to this question: Precisely how much new material should be applied annually to the tracks for replacement purposes?

This question is in order because of the progressive declines that have been occurring in the amounts of new rail and crossties applied in the tracks annually. Estimates based on figures supplied by most Class I roads indicate that crosstie renewals in 1958 slumped to a new low since the railroads reached their present state of growth. The estimated figure was 15 million. The amount of new rail laid in replacement dropped to 378,000 net tons. This was also a new low.

The low rate of material replacement last year can be attributed in part to the recession—but only in part. Even during the immediately preceding years—years of relative prosperity—tie renewals were declining. In 1957 tie renewals were only 21.5 million, or 67 per mile of maintained track. This would indicate an average tie life of about 45 years. For the five-year period, 1953-57, average annual tie renewals for all Class I roads amounted to 74.2 per mile. This figures out at an average tie life of 40.7 years.

Rail renewals tell pretty much the same story. The tonnage of new rail laid has declined in every year since 1947. In that year the Class I roads laid 1,617,140 net tons of new rail, or about four times the amount they laid in 1958.

There is no question that the railroads are getting more life from their track materials today than ever before. The life of crossties is reflecting the use of larger tie plates, tie pads and other means of protection, as well as the full effects of preservative treatment. The service life of rail is being similarly affected by better means of protection and improved manufacturing techniques.

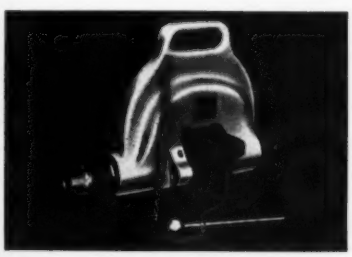
The important question is whether the railroads are getting as much life from rail and ties as indicated by the current replacement figures. There are indications this question is beginning to command serious consideration in various quarters. It should. The use of a factor of safety is basic in all engineering design. The need for an adequate factor of safety is greatest for structures that are not susceptible to exact mathematical analysis. Railroad track is in the category of such structures.

"Deferred maintenance" is a term often heard in the railroad maintenance-of-way field. Statements have frequently been made to the effect that the railroads were "skating on thin ice" in allowing the accumulation of deferred maintenance. As a result of repetition these predictions appear to have suffered a loss of meaning and significance.

Perhaps there has been too much loose talk about deferred maintenance. But the fact remains that the railroads *can* fall behind in replacing the wear and tear that takes place in the track structure. It has now become important for them, individually and collectively, to take a long, hard look at this matter with the objective of determining, as exactly as possible, where they stand.

MHD

R SETS NEW RECORDS IN RAIL LAYING



VELOCITY POWER RAIL PUNCH
Takes only an instant to punch clean, smooth hole for track bolts or rail bonds. Needs no electricity, compressed air, hydraulic power; operates from small blank cartridge; no open flash or recoil. Only one major moving part, the piston.

MECO POWER RAIL LAYER

Makes new records in Time Saving! This machine greatly speeds up the laying of rails of every weight and length. Makes new records in Economy! The Meco Power Rail Layer is inexpensively operated by a standard 4-cycle power unit, usually with a machine crew of 3 or 4 men.

A Meco easily sets in the rails for a large gang of 100 men or more. And—the first cost is only a fraction of that for other rail laying machines.

Maintenance Equipment Company
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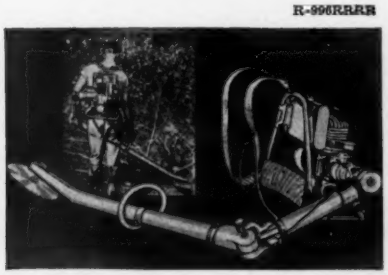
RAILWAY EXCHANGE BUILDING · CHICAGO 4, ILLINOIS

R-996RRRR

MECO RAIL AND FLANGE LUBRICATOR
Doubles to quadruples curve rail and locomotive wheel flange life, by reducing friction between rails and wheel flanges on curves. Also makes possible higher speeds with greater safety.

MACK REVERSIBLE SWITCH POINT PROTECTOR
Prolongs the life of switch rails about 4 times; then is reversed and again extends the switch rail life for another similar period.



BRUSH CUTTER
Cuts right-of-way maintenance costs. One operator with the new, light-weight, Southworth can do the work of eight men using brush hooks or scythes. Extreme maneuverability, "work horse" power, light-weight are important advantages.

Proof of the Seal

This Bird Self-Sealing Tie Pad is removed for inspection after 5 years of service. Because of its tenacious seal, the pad had to be pried from the tie with an adze. Bird Self-Sealing Tie Pads maintain dimensional stability . . . cannot stretch or compress . . . provide a *constant unbroken seal.*

Proof of the Protection

Unretouched photograph of cross section of tie shows underplate area, including spike holes, after 10 years' protection by Bird Self-Sealing Tie Pad. There is no trace of the destructive effects of moisture and abrasion in these vulnerable areas. *Moisture and abrasive materials could not penetrate the seal.*

Effective Tie Pad Performance Depends on the Seal...

and you get Proof of the Seal with BIRD Self-Sealing Tie Pads

The performance of tie pads depends on the permanent and effective seal between the pad and the tie. Any tie pad that is not securely sealed to the tie simply provides a shelter for accumulated moisture and abrasive materials. These destructive agents cause the breakdown of the supporting power of the tie under the plate and the holding power of the spike wood.

Bird Self-Sealing Tie Pads are the *only* tie pads whose durable and effective seal with the tie has been proved through years of in-track service. Actual in-track installation also proves that Bird Self-Sealing Tie Pads increase tie life sufficiently to pay the cost of tie pads many times over. These savings represent a substantial reduction in track maintenance costs.

For an interesting booklet giving facts and figures on dollar savings, write to Bird Tie Pads, East Walpole, Massachusetts, Department HTS

Bird Self-Sealing Tie Pads Are Recommended For:

Bridge Decks • Curves • Switch Timbers
Highway Grade Crossings and Other Paved Areas • Crossing Frogs
Insulated Joints • With Smaller Tie Plates
Pile Cutoffs • Through Station Platforms
Out-of-Face Installations in Rail-Laying Programs • Sandy Locations
All other locations where tie life is short or replacement costs are high.

Buy the Best... **BIRD & SON, inc.** *Established 1795* *Buy BIRD*

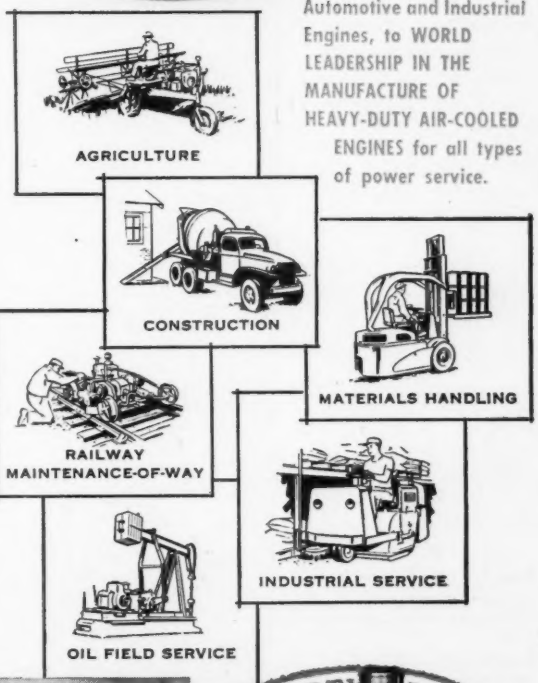
How YOU- can benefit from-

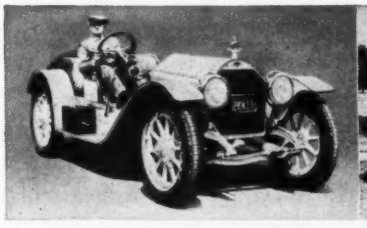
This year of 1959 is the Golden Anniversary of Wisconsin Engines. It heralds 50 years of continuous engine progress. Fifty years of engineering development and exclusive specialization in the design and manufacture of engines.

- From the very first, over a span of 50 years, Wisconsin Engines have been leaders in the internal combustion engine field from the standpoints of *quality* and *performance* . . . with direct benefit to *you* as a power user.
- Originally manufactured in a power range up to 200 hp., Wisconsin Engines helped to make automotive history as well as supplying dependable power for many industrial applications — service that called for the most advanced engineering.
- Heavy-duty design and construction and High Torque performance have been traditional features of *all* Wisconsin Engines. You get longer life from Wisconsin Engines and lowest cost maintenance.
- Today the Wisconsin line comprises the most complete line of Heavy-Duty Air-Cooled Engines in the industry. They are supplied in 4-cycle single cylinder, 2-cylinder and V-type 4-cylinder models in a complete power range from 3 to 56 hp. There is a Wisconsin Engine of the right size and type to fit the job and the machine.
- Every Wisconsin Air-Cooled Engine is designed for heavy-duty service under all climatic conditions from low sub-zero to 140° F. You get the *Most Engine* for your money for MOST HP. HOURS of service.
- For 1959 Wisconsin has available a complete line of factory-built LPG Engines (including conversion kits for field installation on Wisconsin gasoline engines). In addition, we offer a new line of heavy-duty, quality-built Vertical Shaft Engines, from 3 to 7 hp.
- More than 2000 convenient Wisconsin Authorized Service Stations stand ready to provide expert servicing and factory-built parts for all Wisconsin Engines.

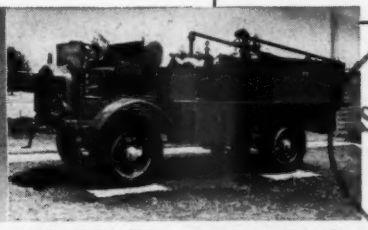
Constructive experience is a priceless asset. The benefits to the manufacturer, distributor and user of power equipment are many. You are best served in all respects when you specify "WISCONSIN ENGINES"... *for better service, low-cost maintenance, trouble-free operation and long engine life.* Write for engine bulletin S-237.

from water-cooled Automotive and Industrial Engines, to WORLD LEADERSHIP IN THE MANUFACTURE OF HEAVY-DUTY AIR-COOLED ENGINES for all types of power service.

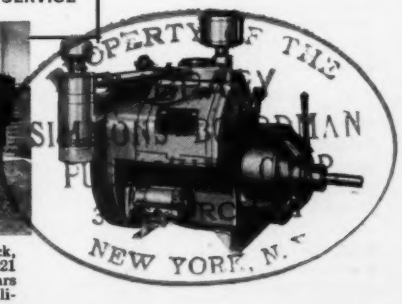




This 1914 Stutz Bearcat, one of the most famous and rugged cars of its day, was powered by a Wisconsin Heavy-Duty Water-Cooled Engine . . . a power leader of high recognition even at that early date.



This FWD Wisconsin-powered truck, known as "No. 28," was purchased in 1921 from Army Surplus, and after many years of service is now on display at the Halliburton Oil Cementing Co., in Oklahoma.



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World's Largest Builders of Heavy-Duty Air-Cooled Engines

MILWAUKEE 46, WISCONSIN

POWER*

exclusive T-POWER construction stops track creepage with up to 5 times more bearing area

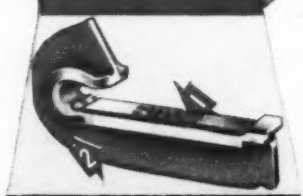
Holding the rail in a vise-like grip, the IMPROVED FAIR rail anchor bears against the tie, tie plate or both. When the stresses of traffic or thermal changes occur, T-POWER stops track creeping cold. Up to 11 square inches of bearing area help to do the job better–Result: Holding power is increased; tie life is extended; maintenance costs are reduced. And, IMPROVED FAIR rail anchors can be applied with maul, sledge or by machine...Get the complete T-POWER story...Write for descriptive literature.

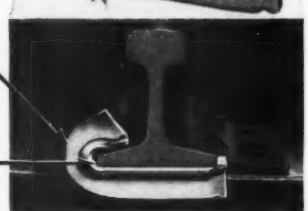
T-POWER means MORE HOLDING POWER

Two full length bearing surfaces give greater resistance to movement.

1. Complete length of T section *rib bears against tie plate* — fits perfectly between rail and tie.

2. Stem of *T section bears against tie* — Inside angle between rib and stem is rounded to compress tie fiber; prevents cutting of tie.





STRIKING FACE provides a perfect target for fast, accurate application . . .

OVERDRIVE STOP assures proper application — everytime. Custom manufactured to fit all types of rail regardless of condition.

* Trademark

IMPROVED FAIR® RAIL ANCHOR

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Division of Poor and Company
CHICAGO • NEW YORK • DENVER • ST. LOUIS • BOSTON
ST. PAUL • WASHINGTON • SAN FRANCISCO • MEXICO CITY

News notes...

. . . a résumé of current events throughout the railroad world

Earnings of Class I roads for October, 1958, were higher than the same month a year ago. If the estimate of $97 million materializes, net income for this month will be up $16 million. For the first 10 months of 1958, however, net income for all Class I roads was still behind by about $153 million. Twenty Class I roads reported that they failed to earn enough to cover their fixed charges in this period. Rate of return for the 12 months ending with October averaged 2.63 per cent, compared with 3.55 per cent in the same period of 1957.

•

Expenditures during 1958 for the purchase of maintenance-of-way work equipment were just about the same as those for the previous year, according to reports received by Railway Track & Structures. However, the number of units purchased was less, indicating that the cost per machine was higher. In 1958, approximately 7,150 units were purchased at a cost of $35.0 million This compares with 8,480 units costing $35.2 million for the preceding year. Of the roads reporting work-equipment purchase plans for 1959, the number is almost equally divided between those that plan to spend more and those that plan to reduce their expenditures.

•

Effective January 1, Commissioner Kenneth H. Tuggle took over the chairmanship of the Interstate Commerce Commission. Under a plan of rotation, he succeeded Howard Freas, who remains a member of the Commission. Mr. Tuggle has been a Commission member since 1953.

•

The legality of the railroad union shop is again headed for the U.S. Supreme Court. Although this tribunal had ruled in 1953 that the union-shop amendment to the Railway Labor Act was legal, it reserved judgment if it could be established that dues were being used for purposes "not germane to collective bargaining." Georgia Superior Court Judge Oscar L. Long ruled recently, in the so-called "Looper Case," that the plaintiffs could not be compelled to contribute money to support ideas, politics and candidates they opposed. Georgia's Supreme Court will now be asked to upset this ruling, after which the U.S. Supreme Court will give a final decision.

•

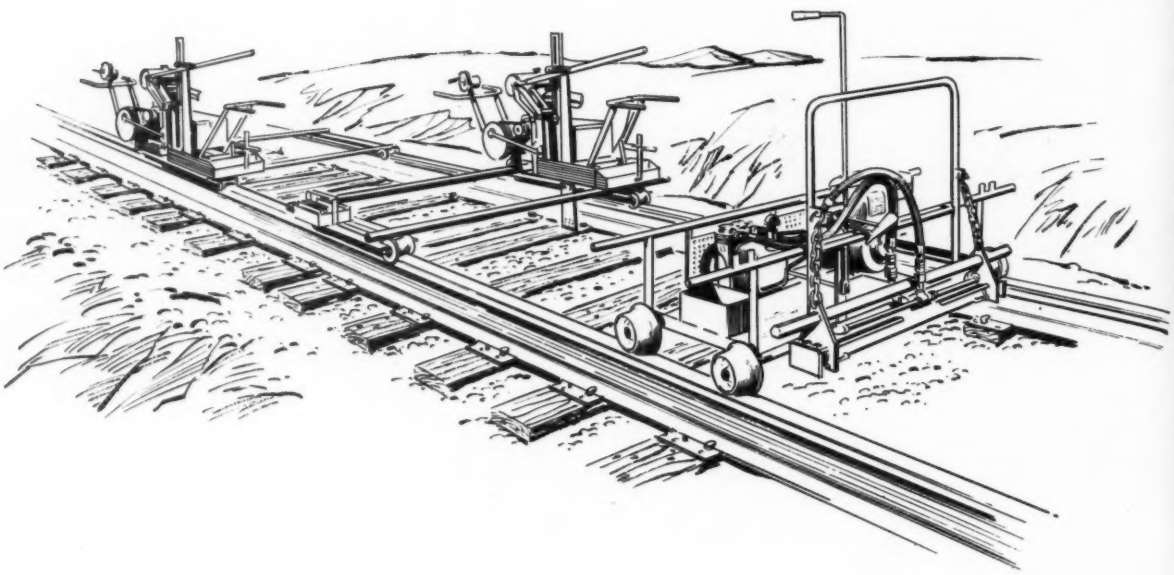
Beginning January 1, 1960, the New York Central will no longer be a part owner of the Railway Express Agency. This decision was dictated by the fact that the road says it is losing about $11 million annually on its express operations. If the Pennsylvania also drops out of Railway Express, as had been indicated, the Agency may become too expensive for the other owners to continue. Loss in revenue of Railway Express is attributed to change in transportation patterns, competition from parcel post service, subsidization of competitors and increasing labor costs.

•

The Canadian Cabinet has approved a system of short-term "subsidies" to the Canadian National and Canadian Pacific. Ostensible purpose is to compensate these two major Canadian railroads for "the unprofitable services rendered in the public interest." Actual effect of the subsidies is to reimburse the roads in part for recent wage increases.

Are you looking for an economical method of CHANGING OLD TIES WITHOUT DISTURBING THE TRACK?

INVESTIGATE THE WOOLERY TIE CUTTER AND TIE END REMOVER



Even ties which are badly rail cut can be removed without raising the track, trenching ballast or adzing tops of ties.

The Woolery Tie Cutter saws the old tie off inside each rail adjacent to the tie plates. The operator of the Tie End Remover then removes the center section of the tie and lowers a hydraulic cylinder in its place. A turn of the valve puts the hydraulic power into action and both tie ends are pushed out from under the rail whether working with single or double shoulder tie plates. Sufficient ballast is then removed to allow insertion of the new tie.

For highest efficiency two saws should be used ahead of one Tie End Remover.

The Woolery machines are light enough so that the operators, by assisting each other, can lift them off the track quickly to clear trains.

Many Railroad men who have used them say, "The best way to change out old ties with least disturbance to the track is to use the WOOLERY Tie Cutter and Tie End Remover."

Write for Bulletins No. 181 and 185.

WOOLERY MACHINE CO. 2919 COMO AVE. S.E. -:- MINNEAPOLIS, MINN.

THE NORTH WESTERN is achieving notable success in its efforts to hold the line on maintenance of way costs.

CHICAGO AND NORTH WESTERN RAILWAY

UNIT SINGLE NOTCH RAIL ANCHORS are achieving notable success in holding rail against creepage. They're in use on the North Western and numerous other railroads.

WHETHER they are used on original application, re-application, new rail or old rail, Unit Rail Anchors "hold the line" against rail creepage.

APPLICATOR MACHINES are available to apply Unit Anchors.

Detailed information furnished upon request.

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ANNOUNCING

SOIL STERILANT

The new dry type weed and grass killer for pre-emergence application . . . Now available for your 1959 program!

Soil Sterilant was developed through an extensive research and field testing program, conducted at 16 locations in 12 states.

A complete report on this program is available. Be sure to write for your copy today.

COMPLETE WEED AND BRUSH CONTROL SERVICE

THE R. H. BOGLE COMPANY

ALEXANDRIA, VA. – MEMPHIS, TENN.

A formula for efficiency

The maintenance-of-way department of every railroad is today facing the challenge of higher costs. It is not possible to find two railroads that are meeting that challenge in precisely the same manner; each road is developing a formula for efficiency to fit its particular circumstances. And no one can say that one formula is superior to another.

The particular methods used on each road to solve its cost problem are not something that just happen. They are the resultant of a combination of forces. One of these is the problem itself. Another is the conditions peculiar to the particular railroad. And, third, is the thinking and know-how applied by responsible officers in their efforts to find the formula best suited to the circumstances with which they are dealing.

These forces can be seen in action on every American railroad today. Frequently their interaction is such as to produce dramatic results. The process may be compared to a chemical reaction. Take a combination of chemicals and mix them under a given set of conditions and you get a reaction that may vary from mild to explosive.

So it is when a railroad endeavors to find a formula for efficiency. Sometimes the results can only be described as explosive. Plenty of examples can be cited. The Chicago & North Western is one of them.

Let's examine some of the forces at work on this road. First, it is a road with a long record of unsatisfactory earnings. Second, in the spring of 1956 its affairs came under the direction of a management team with a bold and aggressive plan of action for putting the company on a paying basis. An integral part of that plan was the conviction that the fixed properties could be administered in such a way as to build new strength into them while at the same time showing important economies. Third, it had an engineering staff that was thoroughly in accord with the latter conviction and which needed only the encouragement and wherewithal to prove that management was right.

Told on following pages is the story of what happened when these forces were brought together. It is the story of the North Western's formula for efficiency.

Facts about the C&NW

The North Western operates about 9,300 miles of road in nine states (see map) and has 1,100 miles of double track. Total trackage, including sidings, yard tracks, etc., amounts to approximately 14,000 miles.

The road has a total of 150 miles of bridges of all types. This includes 2,831 steel bridges having an aggregate length of 75 miles. The remainder consists mostly of timber trestles. There are three major structures across the Mississippi river and two over the Missouri.

The territory served is an important agricultural and industrial area, including the iron ore ranges of the upper peninsula of Michigan and ports on Lakes Superior and Michigan.

In 1957 the road handled 55,300,000 revenue tons of freight traffic, and total revenues were about $218,500,000.

OUTSTANDING example of the road's efforts to reduce unit costs is this graph of the increase in track surfaced per man-hour.

C&NW

FORMULA FOR EFFICIENCY

Board chairman, president act on conviction that wise spending, stable work programs, full mechanization, and careful, responsible supervision can add to a railroad's net income

THE CONVICTION that the M/W department can contribute to net income is shared by C. J. Fitzpatrick, president, and Ben W. Heineman, board chairman.

Management inspires, encourages . . .

● "In maintenance activities any increase in productivity for each dollar spent is the best indicator of effective supervision and administration."

Summed up in these words is the attitude of the North Western's management towards its maintenance-of-way department. They were spoken by C. J. Fitzpatrick, president of the company, in a recent address. What he was saying is that management must, in the final analysis, accept responsibility for the performance of the maintenance forces.

The record is testimony to the fact that the drive toward greater M/W efficiency on the North Western had its inception when the present management assumed control of the road. That happened in 1956 when Ben W. Heineman became chairman of the board. An attorney with a penchant for railroading, Mr. Heineman, as chairman of the executive comittee of the Minneapolis & St. Louis, had already demonstrated a marked ability to inject new life into railroads with unsatisfactory earnings records.

He saw, in the North Western, a potentially profitable carrier. But it was apparent that, to accomplish this end, basic changes in managerial policy were needed. To help bring about the necessary changes, he needed, as executive head of the road, a man with similar ideas and a demonstrated ability to put them into effect. In Mr. Fitzpatrick, then operating vice-president of the Illinois Central, he found the man he wanted.

The new management team lost no time in putting its policies into effect. In so far as the maintenance-of-way department is concerned, the results of these policies are outlined in ensuing articles in this issue.

What we are concerned with here is the nature of the thinking on the part of management that has led to such far-reaching changes in the performance of the maintenance-of-way forces. At the bottom of this thinking is a deeply rooted conviction that, when properly administered, the maintenance forces can produce profits for the company while maintaining the properties to an adequate standard.

In other words, as Mr. Fitzpatrick explains it, "we on the North Western don't accept the view that only the revenue producers can take credit for a railroad's net income." How large that income will be "is determined not merely by the amount of total revenues but also how efficiently and how wisely the spending departments meet their necessary commitments."

What does Mr. Fitzpatrick mean by wise spending? He explains it this way: "On the North Western we don't believe in starting the year with an ambitious program and then chopping it off if business declines. What we do is to chart a conservative but adequate program and hold to it. Only by maintaining a stable program can we use our men and equipment with maximum efficiency. If business picks up during the year, as it did in the fall of 1958, we can add to the original program by, for example, allotting additional ties for insertion on branch lines where we have deferred maintenance."

Then there's the matter of mechanization. Although he is not a maintenance man, Mr. Fitzpatrick has a keen appreciation of the value of mechanization as a means of reducing unit costs. Under the conditions that exist today he is convinced that a high degree of mechanization is the only way that the properties can be adequately maintained.

Thus it was that the engineering department encountered a sympathetic attitude on the part of management when it sought approval of a multi-million-dollar mechanization program.

But this is not all the North Western's management does in lending support and encouragement to its maintenance forces. Says Mr. Fitzpatrick: "When we have approved the annual maintenance budget, I say to the chief engineer, 'Here's the amount of money you can have. Any part of it you can save by reducing unit costs is yours to spend for additional work.' " The result, of course, is a further incentive to reduce costs.

The results that have stemmed from management's attitude on the North Western are tangible and substantial. But there is an intangible element too. "There's been an improvement in morale in all grades of personnel in the M/W department," says Mr. Fitzpatrick. And that, too, can have a beneficial effect on tangible results.

OBJECTIVE of B. R. Meyers, chief engineer, is to "release more dollars for the owners" by use of durable materials and the development of more efficient methods.

Brushing traditional practices aside, chief engineer and staff emphasize new methods, machines and durable materials in bold and aggressive drive to reduce unit costs

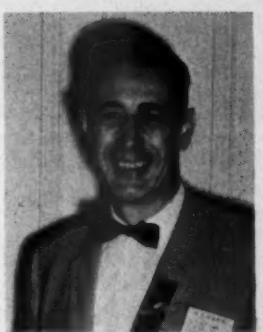
. . Top officers add ideas, know-how

● "The aim of this department," said B. R. Meyers, chief engineer, "is first to provide, efficiently, an adequate plant for carrying out the business of the company. In other words, by using good-quality materials, adopting new cost-saving methods and practices and mechanizing our work as much as possible, we are trying to produce track where trains can be operated at desired speeds without delays from slow orders."

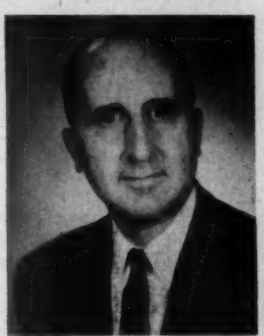
Since becoming chief engineer of the North Western in 1952, Mr. Meyers has had the opportunity of placing some of his thoughts into action. All his decisions are directed toward a course which will reduce future maintenance expenses. For instance, he has adopted a hard quartzite crushed and graded rock for ballast. This was done with the conviction that better materials will have longer service and will result in less maintenance.

Rising wages are a perennial problem in holding down costs. "With the cost of labor increasing every year," Mr. Meyers explained, "it becomes mandatory for us to develop ways of doing our work more efficiently to offset the increased labor costs. But we want to reduce our unit costs so we can get ahead of these wage increases. We not only want to do more work with the same amount of money but we also want to keep our overall budget in line and thereby release more dollars for the owners."

Impressed by the large returns potentially possible through mechanization, he has encouraged his staff officers to explore fully the possibilities of supplanting labor with machines. The current management has been generous in advancing money for this purpose and investments in work equipment have increased yearly. For the last two years, such annual expenditures have been over $1 million.



W. H. Huffman
Assistant chief engineer



M. S. Reid
Engineer of maintenance

"We work with many manufacturers, in developing new machines. These companies know we are ready and willing to try out on our railroad any pilot models that appear to be safe and to have possibilities. Through tests we carefully analyze the performance and economics of new machines and if their use will reduce our labor costs, we request money for them."

Although convinced that machines provide a means for reducing unit costs, the chief engineer is equally convinced that the mere possession of these units is not enough. They must be used to the best advantage. This means changing traditional and conventional methods and practices and the organization of the maintenance forces to develop the lowest possible unit costs.

For achieving this end, Mr. Meyers appointed a process engineer and an assistant in 1957. These men are constantly in the field. They study all track-work operations and have the authority for making any on-the-spot changes in organization or equipment they feel will produce greater efficiency.

"I believe we have only scratched the surface, so to speak" the chief engineer continued, "in developing ways and means to carry out our work more efficiently."

Mr. Meyers' two "right-hand" men are the assistant chief engineer and the engineer of maintenance.

W. H. Huffman, assistant chief engineer, in general handles construction work and dealings with public authorities. M. S. Reid, engineer of maintenance, is directly responsible for maintenance work, although the organization is flexible enough that either man can handle any matters, when required, as they arise.

TRACK STANDARDS include crushed quartzite rock ballast, treated No. 4 and No. 5 ties, 115-lb rail welded into 78-ft lengths, 6-hole bars and double-shoulder tie plates.

For the track—

More strength and durability

Working on the premise that better and heavier materials mean less maintenance and prolonged service life, the C&NW has upgraded its track standards. The most recent improvement is the adoption of hard quartzite ballast.

● One way by which the C&NW intends to lower over-all maintenance costs is by using high-grade materials. By so doing, it anticipates that greater durability will be obtained and less labor will be required for maintenance.

In considering the track standards of the North Western, it should be noted that the traffic carried by the trunk lines of this road places it in the medium-duty class. Hence, although the road has some mileage of 131 and 132-lb rail sections at special locations, the 115-lb AREA rail section, which is standard for new-rail programs, is considered adequate for the traffic carried.

Practically all of the new rail is welded into 78-ft lengths for the elimination of half the joints and their attendant problems. This is done by the oxyacetylene pressure-welding process at a Linde plant set up near West Chicago, Ill. Occasionally, longer strings are welded together for insertion through highway crossings, along station platforms, and at similar locations. All of the pressure-welded rail is ground and finished before shipment so that no additional work is required in the field. The plant finishing work includes removal of the upset metal by shearing and grinding and the peening of all bolt holes.

The 36-in, 6-hole, toeless, head-free bars, fastened by 1-in by 5½-in heat-treated bolts with medium-carbon nuts, are standard.

The current standard for tie plates is the double-shoulder, 7¾-in by 11-in flat-bottom plate (AREA Design No. 4), with punching A—7 spike holes. These are fastened to the ties by ⅝-in by 6-in cut track spikes. In addition to the two line spikes, each plate is secured to the tie by two hold-down spikes on curves 2 deg and over. Tie pads are used under plates applied under insulated joints and the shoulder ties, on sharp curves, through all gum highway crossings and over open-deck bridges.

The North Western uses various makes of rail anchors. In heavy-traffic double-track territory it uses a minimum of 56 anchors per 78-ft panel, or 28 per 78-ft rail length. On single track it applies a minimum of 56 anchors per 78-ft panel, the number applied for each direction of traffic being governed by local conditions. On lighter traffic lines where relay rail is laid, a minimum of 24 anchors per 39-ft panel may be applied.

Ballast — For many years the C&NW used crushed limestone or processed gravel, depending upon its availability, for ballasting its track. In recent years, it used blast-furnace slag on certain heavy-traffic lines, although the increasing demand for slag as a foundation for new highways has had the effect of limiting the supply available for railroad ballast.

To assure itself of an adequate supply of high-quality ballast for years to come, the road purchased property at Rock Springs, Wis., in 1957 to quarry rock for ballast. The material obtained here is a quartzite rock, harder than granite and very durable. It is rated far superior to any ballast previously used by the road. The crystalline rock contains small iron deposits that are pink and lavender in color. For this reason the maintenance forces have dubbed the quarry "The Pink Lady."

Modern crushing, screening, conveying, loading and other quarrying

equipment was installed at Rock Springs, and the quarry was put into operation late in 1957 under contract with Foley Brothers, St. Paul. The rock is crushed and graded to range in size from ½ in to 1¾ in for ballasting the more-important main lines and from ½ in to No. 10 screen for ballasting the secondary main lines. The fines below No. 10 screen are now being tried out for use around yard buildings and as a surfacing material for driveways.

Henceforth, the new quarry will supply most of the ballast required for the entire system.

Crossties — Main-line ties are all No. 4's and No. 5's in size, sawed top, bottom and sides, and all are treated with a creosote-petroleum solution. The ties are mostly oak with some mixed hardwoods, with some softwoods being used on the Western lines. All ties with splits or showing a tendency to split before treatment are doweled with steel dowels in lieu of the conventional anti-splitting irons. Some ties are doweled after treatment.

During the last three years, the road has used a number of good, useable treated ties when making tie renewals. These are ties recovered from double-track lines where one track has been removed or from retired branch or side tracks.

At crossings with heavily traveled highways, it is the road's practice to use prefabricated crossing panels of treated gum. Before installation the track is completely rehabilitated to insure maximum service life for the crossing. At crossings handling moderate traffic, black-top materials are used. Planks 4 in thick are used at unimportant crossings.

Rail lubricators are installed wherever investigation shows them to be economically justified. Two types, Meco and Racor, are used.

Special Trackwork — The North Western specifies railbound manganese-insert frogs for all its new crossings and turnouts in new-rail territory. Standard turnouts are No. 10's, 14's and 20's, depending upon the speed required. This same standard applies to relay-rail territory except that bolted open-hearth frogs with bevel points are used. Spring frogs have been eliminated from the road's standards and, when a spring frog must be renewed, it is replaced with a rigid frog.

Weed control—Weeds in the track zone are controlled for the most part by the application of aromatic oils. On three divisions, sodium-arsenite solution was tried out in 1958 for comparative purposes. Other chemicals are used to some extent for noxious weeds, and dry chemicals are applied in yards and around bridges. The road applies the aromatic oil with its own forces and equipment and has converted its Fairmont weed burners into spray units. Chemical sprays for special weed conditions, or for brush, are applied both by company forces or under contract.

REFLECTORIZED roadway signs are made by railroad forces in a modern shop at Fond du Lac, Wis. The shop makes its own silk screens for the more common signs.

Makes reflective signs in modern shop

All the North Western's roadway signs, except the concrete whistle posts, are now made of aluminum and have reflective facings. These are produced all year 'round at the road's sign shop at Fond du Lac, Wis. This shop is well organized for its purpose and is equipped with the latest equipment for making signs of reflective sheeting. As a consequence, it is frequently used by representatives of the Minnesota Mining & Manufacturing Co. as a model when showing others how to lay out and equip a sign shop.

Extruded - aluminum blanks are used for crossbuck signs and most other types. Aluminum plates are used for a few others. Before the reflective material is applied, the blanks are immersed in a tank containing a fog of hot tetrachlorethylene solution for degreasing them. They are then transferred to a tank containing a solution of phosphoric acid for removing the degreasing agent, after which they go into a rinsing tank. They are then dried.

Usually, the letters and figures are applied to the reflective sheeting before the latter is placed on the aluminum blank. This is done by the silk-screen process. The shop forces make their own silk screen templates for the signs for which there is a large demand. The signs in this category include those reading: "RAIL ROAD CROSSING," "S" for station-one mile signs, mile boards, signs for marking the beginning and ending of locations where slow orders are in effect, "NO CLEARANCE" in both the vertical and horizontal patterns, and "CROSSING START" and "CROSSING RE-START" for highway crossing signals.

Signs for which there is a limited demand, such as those for station names, and speed restriction, highway "STOP," warning and other special signs, are made by positioning each letter or figure on the reflective sheeting by hand.

The lettered reflective sheeting is baked on the aluminum blanks by the vacuum-heat process.

The silk-screen process has been instrumental in greatly reducing sign-production costs. Before the silk screens were used, the shop used wood templates for positioning the letters and figures on the reflective sheeting. Production averaged about 40 crossbuck signs per day. With the silk-screen process, the production averages over 200 signs per day. With increased production came decreased costs.

C&NW
FORMULA FOR EFFICIENCY

Set work goals for year

Through mechanized accounting all charges are reported currently for guidance of responsible officers. Controls, made possible by IBM accounting, produce 30 per cent reduction in inventory.

● One of the aims of the North Western is lower work-unit costs. It is reasoned that this aim can be achieved only by proper planning and better supervision. It is also reasoned that the best results are obtained when each supervisory officer plans the work which he is directed to carry out for the year ahead and for which he is responsible, including the cost and the time such work should be done, so these plans can be coordinated with all concerned. It is held further that each supervisory officer should be responsible for seeing that the plans are followed and the work done in the most economical way. Such a plan was put into effect for the year 1958, and is called "responsibility accounting."

ALL COSTS are processed by machines and monthly statements are issued.

Now has "functional budget"

As part of this plan, the C&NW set up what is known as a "functional budget" which lists every item of work chargeable to operating accounts which has been authorized for the year. It is a maintenance budget. The work of preparing this budget is a project in which every man with supervisory responsibility participates.

Prior to the actual preparation of the functional budget, certain preliminary steps already have been taken. Along about July of each year, management estimates approximately how much money will be available for the following year for each department. Using these allotments, the heads of the various departments set up a tentative budget, divided between capital and maintenance. The capital budget is made out before the functional budget is started.

With the ways-and-structures department, the capital budget includes all major improvements to the roadbed, track, bridges, buildings, signals, communications and electrical subdepartments. Recommendations for these items, marked as to the order of preference, are received from the division engineers and superintendents or from the heads of the sub-departments. Before these items are included in the capital budget, they are screened by the top officers in the engineering and other interested departments.

The maintenance budget includes the man-power allowance, which is almost on a fixed basis, and the cost of material items used in maintenance. The big item here is crossties. Other major items are the restoration of roadbed, bridge ties, rail and joint-bar replacements, ballast for patch work surfacing, bridge and building maintenance, signal, communication and electrical repairs, and similar items.

When all budget recommendations are in for consideration, the chief engineer makes the final determination with the president as to the number of crosstie renewals to be made and the extent of the rail, ballast and other programs. Each division engineer, roadmaster and supervisor (responsibility area) is advised as to the capital-account programs and allowance for payroll and materials each will have by months for maintenance purposes for the following year. It is then up to each responsibility area to plan the

CHICAGO AND NORTH WESTERN RAILWAY COMPANY
FUNCTION BUDGET
YEAR 19 59

DIVISION OR DEPARTMENT GALENA NO. 3103
RESPONSIBILITY AREA ROM - Sterling
FORM NO. BU-4 PAGE 1 OF 24

3103 ROADMASTER-STERLING (ILL.)

FUNCTION DESCRIPTION	FUNCTION NO.	TOTAL FOR YEAR	MONTH OF – APRIL TOTAL	APRIL LABOR	APRIL MATERIAL	APRIL OTHER	MONTH OF – MAY TOTAL	MAY LABOR	MAY MATERIAL	MAY OTHER	MONTH OF – JUNE TOTAL	JUNE LABOR	JUNE MATERIAL	JUNE OTHER
ENGINEERING SUPERVISION	3000		1700	1600	-	100	1700	1600	-	100	1700	1600	-	100
TRACK INSPECTION BY TRACK SUPERVISORS	3110		500	480	-	20	510	480	-	30	510	480	-	30
TRACK INSPECTION BY TRACK FORCES	3120		3400	3400	-	-	3100	3100	-	-	3000	3000	-	-
WEED CONTROL-RUNNING TRACK	3130		200	200	-	-	150	150	-	-	1700	400	1300	-
WEED CONTROL-OTHER TRACK	3131		-	-	-	-	-	-	-	-	650	150	500	-
SHOULDER RESTORATION OF ROADBED	3140		-	-	-	-	-	-	-	-	-	-	-	-
ROADWAY MAINTENANCE-RUNNING TRACK	3150		2600	2000	-	600	700	700	-	-	500	500	-	-
ROADWAY MAINTENANCE-OTHER TRACK	3151		900	800	-	100	200	200	-	-	400	400	-	-
REMOVING SNOW ICE & SAND FROM ROADWAY	3160		-	-	-	-	-	-	-	-	-	-	-	-
CROSS TIES-RUNNING TRACK	3170		1750	-	1750	-	3400	-	3400	-	5000	-	5000	-
CROSS TIES-OTHER TRACK	3171		400	-	400	-	1300	-	1300	-	600	-	600	-
SWITCH TIES-RUNNING TRACK	3180		400	-	400	-	1500	-	1500	-	2000	-	2000	-
SWITCH TIES-OTHER TRACK	3181		400	-	400	-	1200	-	1200	-	800	-	800	-
RAIL-RUNNING TRACK	3200		250	-	250	-	350	-	350	-	300	-	[illegible]	-

FUNCTIONAL BUDGET includes every conceivable item of maintenance. It is the supervisors' authority for carrying out work.

nd check progress monthly

year's work within the scope of the allotments.

Thus, each supervisor becomes an estimator and uses his judgment based on his knowledge of local conditions and past experience to prepare his budget. Every conceivable maintenance item of material and work is estimated. This work is set up by months and completely detailed by accounts.

When all costs of the proposed work have been estimated, the estimates are sent to the engineer of maintenance, where they are checked. The estimates then are sent to the accounting department where the information is punched on cards and processed through IBM machines to produce the printed forms which become the final capital and functional budgets. Each responsibility area is then sent a copy of the sheets showing the work for which each is responsible and is charged with seeing that the work is done as programmed.

Shortly after the end of each month of the budget year, these men receive statements showing the exact amounts each has expended during the previous month by each account, as well as the accumulative costs to date.

The real value of the functional budget is that it makes all responsible officers acutely aware of the money that is being spent. It also sharpens supervision because each responsibility area is subject to being called upon for an explanation if costs get out of line with the approved budget. On the other hand it is beneficial to each responsibility area. Once approved, the functional budget assures each supervisor of the maintenance work which he will do the following year. He can make his plans accordingly. For AFE work, additional labor is authorized.

Determining tie renewals

Tie renewals afford an example of how the functional budget works.

Prior to the preparation of the functional budget, section foremen make an inspection in July of the ties on their sections. A keel mark is made on the rail above each tie the foreman thinks should come out. A count of these markings is made by miles and it is forwarded to the roadmaster. The latter goes over the recommendations and makes spot checks of the inspections. When satisfied, the roadmaster then sends a statement showing the requested tie renewals to the division engineer. In turn, the division engineer also makes spot checks and, when satisfied, submits a consolidated statement showing the proposed renewals by miles for each subdivision to the engineer of maintenance.

The division statements are reviewed by the engineer of maintenance and checked against spot checks made by his staff during the summer. Adjustments are made for the locations where rail will be relaid and the track ballasted, particularly where the Mannix undertrack plow is to be used. After management has decided upon the total number of ties to be renewed during the following year, the division engineers and roadmasters are advised as to the number allotted to each territory. These are then included in the functional budget.

Here's how inventory was reduced

Another means by which the North Western effects economies is through a new accounting system which makes it possible to exercise extremely close control over material stock. Called Mechanized Inventory Control, this system has been successful in reducing the road's stock of materials from $21 million to $15 million in 1958 alone.

Briefly, the system is set up as follows: All materials normally used have been assigned class and code numbers. Also, all usage locations have distinctive numbers which designate the department, responsible officer and stock point. Each such point also has an authorized allotment for each item of material which may be kept on hand. Whenever material is used, transferred, recovered, received, scrapped, or placed on order, the responsible officer shows such information by code numbers on appropriate forms. These are sent to the accounting department (as well as other interested parties) where the information is processed by IBM accounting machines.

Shortly after the end of each month, the accounting department issues reports which show the status of the material items, including the number of units used, and the number on hand and where stored. This permits management to govern the purchase of new units and their transfer from one point to another. It also results in a usage pattern by months which is helpful in anticipating future use of particular items.

The North Western also is cutting down on inventory by permitting using officers to purchase small quantities of some commonly used materials locally. This is particularly important with such items as plywood, lumber, cement, doors, windows, hardware, etc. After clearing with the local responsible supervisor, the foreman is authorized to obtain the material from a local supply house, charging the cost to the railroad. By this authorization the foreman obtains the material in good condition, and can complete his work without delay. Other items not commonly used, such as small parts for earthmoving machines, also may be purchased from the nearest local distributor by a field mechanic after first clearing the purchase with the engineer of scales and work equipment.

The practice of granting authority to division supervisors and other field representatives to purchase materials locally, not only holds inventory to a minimum but it also results in the elimination of wasted labor through delays involved when waiting for materials. The fact that any unused materials purchased locally can be returned is also an advantage.

Experience of the North Western is that there may also be a cost saving in permitting local purchases of materials. It is true that the prices paid for such purchases are usually higher than when the items are obtained from the stores department. On the other hand, the labor charges for unloading and loading when materials are purchased in bulk lots by the purchasing department are eliminated. Also saved is the interest on the investment in material held in stock.

Big changes in track forces set stage for mechanization

Road eliminates need for large section forces by using maintenance gangs for normal track maintenance and making modern equipment available to them. Other gangs, highly mechanized, take care of more extensive out-of-face work.

MAINTENANCE GANGS do the work which formerly required the bunching of several section gangs.

C&NW FORMULA FOR EFFICIENCY

● Gradual changes in the organization and mechanization of the North Western's track forces began with the advent of the 40-hr work week in 1949. About five years ago, however, the tempo of these changes showed a marked increase. The big changes have been in the further extension of section limits, the increase in the number of maintenance gangs, the extensive mechanization of the larger tie, ballast and rail-laying gangs, and the intensification of supervision.

In 1954, the road had 836 sections with an average of 3.7 men (including foreman) per section. These sections averaged about 12.3 miles of main track and 4.3 miles of side track, totaling 16.6 track miles. In 1958, five years later, there were 393 sections with an average of 4.1 men (including foreman) per section. These now average 25.8 miles of main track and 8.8 miles of side track, giving a total of 34.6 track-miles for each section to maintain.

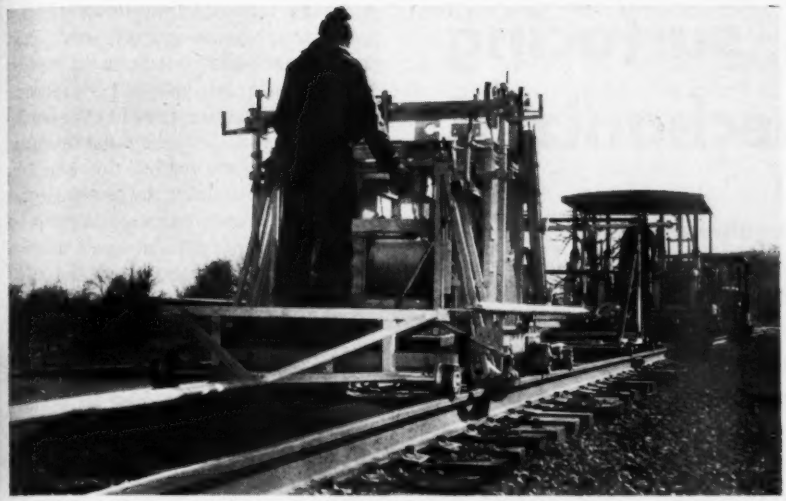
However, the work which the section forces do has been materially changed in that time. Spot surfacing, formerly done by these men, is now replaced by the out-of-face "skin-lift" operations of the subdivision maintenance gangs. Other work done by these gangs includes the transposition of rail on curves, the construction and maintenance of industry tracks, frog and switch renewals, rehabilitation of highway crossings, etc., which the section forces formerly handled. In short, much of the work once done by the section forces is now carried out by others. The primary work of the section forces today includes the making of spot tie renewals where it would not be economical to move in a mechanized gang, the tightening of bolts, tapping down high spikes, renewal of crossing planks, replacement of broken joint bars, snow removal, necessary track inspection and other miscellaneous chores.

The maintenance gangs were originally organized on the trunk lines of the C&NW in 1949 to do the work which the extended section forces were unable to accomplish. These gangs consist of from 8 to 10 men and are furnished with track machines and trucks. The latter are 1½-ton trucks with steel stake-bodies over which canvas tops are stretched. They are fitted with winches, folding side seats, dumping attachments and folding rear steps. As more and more trucks and other mechanical equipment were acquired, the number of these gangs was increased accordingly. By 1954, the road had 44 such gangs. In 1958 it had 72. All were furnished with modern equipment. Every roadmaster now has one or more of these gangs at his disposal for work anywhere on his subdivision.

Besides doing work which the section forces formerly handled by bunching men from two or three sections, the maintenance gangs now have a very important function which was born out of a change in policy in 1957. Like most roads, the North Western kept its tracks spot surfaced and lined to lengthen the intervals between ballasting. It was noted, however, that a considerable number of hanging ties remained after the passage of the spotting gang, and these detracted from the riding qualities of the track. To overcome this problem, the road started the practice of raising the track about 1 in (called "skin lift") on an out-of-face basis. Thus, every tie gets tamped and hanging ties are eliminated.

The skin-lift operation was tried out with one maintenance gang in 1957 on track which had previously been ballasted and now needed tightening up. The gang was equipped with a Nordberg Trak-Surfacer, a Jackson Track Maintainer, a Nordberg Trakliner, a Kershaw Track Broom and a Ballast Regulator. Only a foreman and a gang of six men, comprised of four machine operators, an assistant machine operator and a laborer, were worked with this equipment over 26 miles of track. The results were so satisfactory that the C&NW similarly equipped several other maintenance gangs in 1958. These gangs have averaged 30 track-feet surfaced per man-hour and have covered as much as 4,100 ft of track in a day.

The skin-lift gangs have enabled the road to get more raising and surfacing done than ever before. They are used on track previously raised and ballasted within a few months after such work is done. The effect is to tighten the ties and put a finish surface on the track, which the road anticipates should hold for at least four or five years. These gangs also



SKIN-LIFT GANGS are highly mechanized and have enabled the road to get more raising and surfacing work done than ever before. Also, they extend ballasting cycle.

TRACK SUPERVISORS handle patroling and cover about 80 miles of track.

are employed on track where heavy tie renewals by tie gangs have disturbed the surface, as well as on track where the need for better surface is indicated.

The North Western plans to do more of the skin-lift work in 1959. Additional maintenance gangs will be used on this type of work as the necessary equipment is acquired.

When the 40-hr work week went into effect in 1949, the section limits were extended and the forces placed on a 5-day week, Monday through Friday. To insure that the track on the trunk lines would be adequately patroled, the road created the new position of track supervisor. Ranking just above the section foremen, the track supervisors patrol the track from Tuesday through Saturday. The section foremen patrol their track on Mondays, which keeps them familiar with track conditions on their territories. This arrangement also affords the section forces sufficient time during the remainder of the week to carry out their regular work.

The track supervisors are each furnished with a motor car and patrol approximately 80 miles of track. They report observed track conditions to the roadmaster after each inspection trip so that he may take the necessary measures to correct any inadequacies. The plan of using track supervisors for this purpose has worked out well enough that their number has been increased. By 1954, the road had 46 track supervisors. In 1958, there were 53 track supervisors, enough to place one or more on each roadmaster's subdivision.

Track material maintained by field welding

The C&NW does not have a reclamation shop for turnout and special trackwork materials. It prefers to make repairs to frogs and switches by grinding and welding them in track. As a result most roadmasters have the services of a welder and helper, and sometimes two of each.

These men are assigned work by the roadmaster but they are under the technical supervision of a system supervisor of welding. They work all year 'round and, while a few have house trailers, they usually live in bunk cars provided by the railroad. Although several have stake-body trucks, all have Fairmont M-14 motor cars and push cars. Also, all are equipped with oxyacetylene welding and cutting equipment, a Mall flexible-shaft utility grinder and attachments for surface grinding, rail slotting and other grinding applications.

The railroad welders work on open-hearth steel and are not provided with electric welding plants. Hence, the welding of manganese-steel parts is done under contract through several welding contractors who submit bids for the work to be done. About 30 to 60 days after they complete their work, the railroad welders follow up and grind off any excess overflow metal that may have formed. This practice extends the interval between welding jobs.

A large portion of the welders' time is spent in the repair of frogs, switches and crossings. Frogs are welded and rewelded to keep them in good condition until the welding costs become uneconomical. At that time, the component parts of the frogs have become too loose for further welding and heavy wear on the rails is generally present which makes scrapping mandatory.

For yard-track work the welders are called upon to bend stock rails, repair switch stands, form compromise bars, repair switch rods and to cut side-track rails. Other ordinary work includes the repair of track tools, the cutting of bolts ahead of rail gangs and emergency work in connection with derailments.

Wheel burns are called to their attention by the roadmasters. These are repaired, when possible, by welding or grinding as they occur.

The local welders take part in out-of-face work also. This includes the building up of rail ends in the conventional manner. Although some of the new rail is received end-hardened, the remainder is hardened in the field by the local welders, using the oxyacetylene method and atmosphere quenching.

Another out-of-face work item is the flame-crowning of joint bars. This is done by heating the base of the bars near the middle and allowing them to cool. Cooling tends to shrink the metal in the lower part of the bar and effects a crowning. Usually, this work is done in advance of a surfacing job. On double track, the bars are reversed to compensate for wear before crowning.

Tie renewals, surfacing are highly mechanized

The organization and equipment used on the North Western to renew ties and surface track vary somewhat with conditions. Tie renewals may be carried out ahead of or behind an undertrack plow or where no plow is used. But under all conditions the gangs have one thing in common—maximum use of machinery.

When done behind undertrack plow . . .

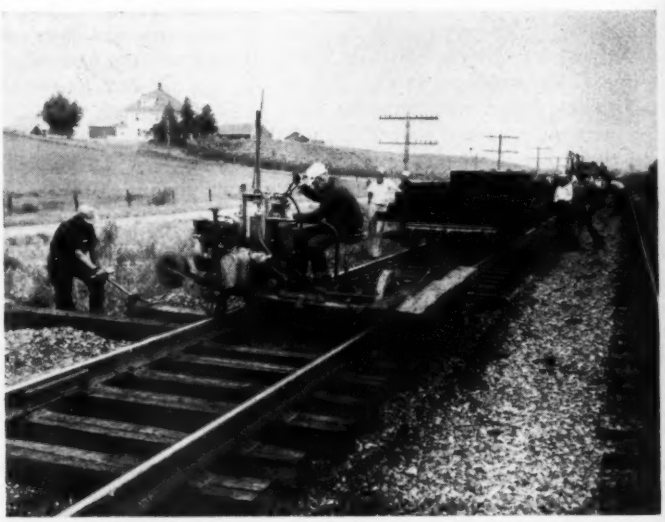
FOUR of the 12 laborers in the plow unit knock down the ties marked for renewal while the track is in the elevated position. Four other men pull these ties from the track.

● At the present time about 40 per cent of the crossties on the North Western are renewed by mechanized gangs. More would be installed by these gangs except for the fact that the number of renewals per mile must be reasonably heavy to realize the benefits from mechanization. As the railroad gradually converts to the cycle basis of maintenance, the percentage of ties installed by mechanized gangs will increase.

The tie gangs vary in size and equipment in accordance with the location and traffic conditions. Some units are worked ahead of an undertrack plow in single-track territory. In general, these gangs are comprised of a foreman, an assistant foreman and 30 men who install from 400 to 750 ties per working day. For the most part, they are equipped with Fairmont machines, including spike pullers, rail lifters, tie removers, tie-bed scarifiers, and tie inserters with and without booms. Also, each of them has an on-and-off track compressor for operating pneumatic spike hammers.

Other special tie-renewal units of 37 men are used where the track is to be reballasted, ties respaced to 23 per 39-ft panel, and where the undertrack plow is not to be used. Such locations are found on "400" train territories where train delays must be kept at a minimum; and at locations where traffic is too dense to permit the economical use of the plow. They raise and surface from 0.6 to 0.7 mile of track on the old ballast to permit installing and spacing ties. These

SPACING TIES to the road's standard of 23 ties per 39-ft rail is done by two mechanical tie spacers.



TIE INSTALLATION is made by three tie inserters. In background are rail lifters, spike drivers and on-track compressors.

gangs are somewhat larger than the first-mentioned units and are comprised of an extra-gang foreman, an assistant foreman, a timekeeper and 37 men. They are usually followed by a 19-man surfacing gang.

On some branch lines, the heavy tie renewals are made by a combination tie-and-surfacing gang of 35 men. About 10 to 12 men of these gangs, using Woolery and Fairmont tie-renewal equipment, insert the ties ahead of the surfacing work. The latter is done by the remainder of the gang with the assistance of a Nordberg Power Jack and a Jackson Multiple Tamper. Sometimes a Trak-liner and a Kershaw Ballast Regulator also are used. Such gangs complete about 0.5 mile each day, depending upon traffic conditions.

One of the largest track gangs uses 75 men. This outfit works with a Mannix plow and liner on double-track territory where the track can be temporarily taken out of service and assigned to the gang, or on single-track territory where traffic density permits liberal occupancy of the track. In 1958, 67.4 miles of track, of which 24 miles were single track, were plowed.

The ballast gang is divided into three parts, a 12-man plow unit under a foreman, a 33-man tie unit under another foreman and a 26-man ballast unit under a third foreman to unload the ballast and surface the track. Overall supervision of the gang is directed by a general foreman.

The plow unit of this gang travels at an average rate of about ½ mile per hour and the tie-renewal unit about 800 ft per hour. The ballast unit moves about 3,500 ft per day, which is the average dictated by the time which the track can be held out of service during the day. However, it is not uncommon for the ballast unit to raise and surface a mile in an 8-hr day. On one occasion it completed 5,460 ft of track in 5 hr 40 min on-track time.

The lead unit includes a Mannix technician, who assists in the operation of the plow and liner. Four of the 12 laborers knock down those ties which are marked for renewal. Four other men, with tie tongs, pull these ties from beneath the track. Two laborers remove the tie plates from the removed ties and place them where they can be readily found for reuse, and two laborers have miscellaneous duties.

The second gang unit handles the tie spacing and renewals. The lead machine of this unit is a Fairmont weed burner which has been converted into a water-spray car. This machine is used for cooling the rails of the skeletonized track in hot weather to prevent track buckling.

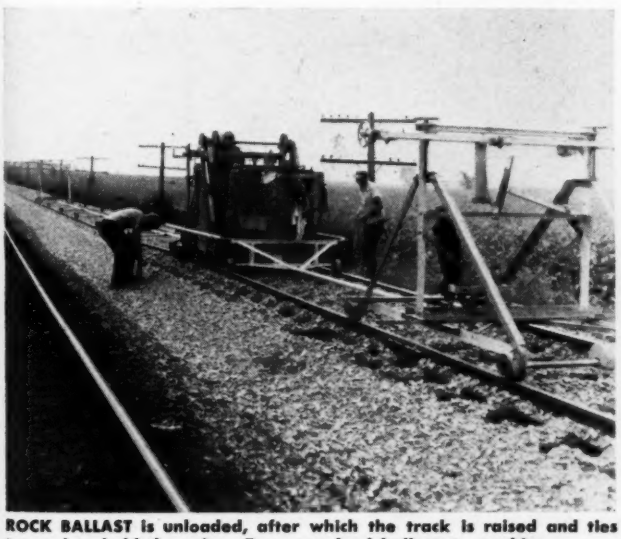
C&NW
FORMULA FOR EFFICIENCY

TIE RENEWALS on some branch lines are made by using tie cutters.

Ties are spaced by machine

The North Western uses the skeletonized track condition as an opportunity to economically respace the crossties to its standard of 23 ties per 39-ft rail. To prepare for this operation, two laborers, working one to each rail behind the water-spray car, knock off the rail anchors. Another laborer, with a template, keel-marks the proposed tie centers on the ball of the rail. Following behind are two Pullman-Standard Tie Spacers working in tandem. Usually each machine spaces the ties in every other rail.

These relatively new machines have enabled the road to reduce its former complement of men in the tie unit by 20 men. Operated by one man, these tie spacers are self-propelled machines designed to space and straighten new and old ties during heavy tie-renewal operations. They are also designed to



ROCK BALLAST is unloaded, after which the track is raised and ties tamped to hold the raise. Two men feed ballast to machine.

TAMPING the ballast under the ties is done by two production tampers. Two men nip ties at each machine.

More on next page

Tie renewals, surfacing (cont'd)

MORE CLEARANCE is provided under overhead bridge by using an Under-cutter and a Ballastex-Screenex combination.

space and straighten ties in out-of-face work where the number of ties per rail is changed.

At one end of each machine, two pairs of tie grippers or tongs, placed one over each end of the ties, are mounted outside the rails. The operator rides the machine between the pair of grippers where he can observe the rail markings and the tie being moved.

One side of each pair of grippers is stationary and is butted against the frame of the machine. Being directly opposite each other, the tongs thus assure that ties, after being shifted, will be at right angles to the rails. The tongs open when raised and have a spread of 15½ in. They close to 6 in. The machine is equipped with a stop which limits the downward stroke of the tongs where the machine is working behind sledding or plowing operations.

Prior to the use of these two machines, the tie unit was unable to keep up with the plow unit. This frequently delayed following operations. With the tie spacers in use, both gang units keep fairly close together.

Also included in the equipment of the tie unit are three Fairmont W-90 tie inserters, two of which have booms for positioning the ties, two Woolery rail lifters, two Racor dual spike drivers and a track-mounted Tractair.

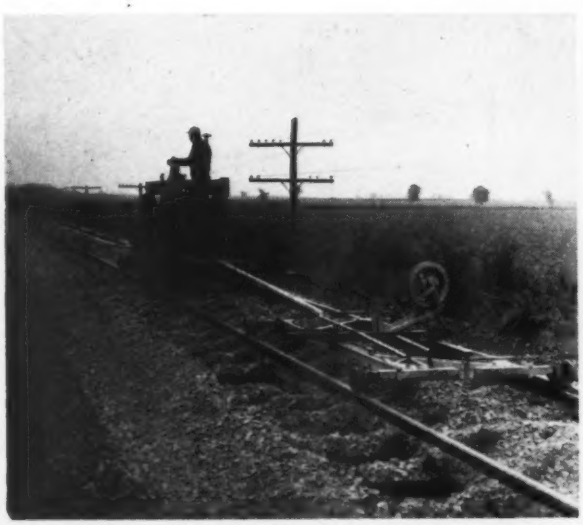
The ballast unit is a 26-man gang comprised of an extra-gang foreman, 1 assistant foreman, 7 machine operators and 17 laborers. It is equipped with a Kershaw Ballast Regulator, a Nordberg Power Jack and Tak-Surfacer, two Jackson Multiple Tampers, a Nordberg Trakliner and a Fairmont W-23 Ballast car for regulating the ballast.

This gang unit averages about 3,500 ft of track per day, depending upon the density of traffic.

Today's extra-gang organization and equipment for renewing ties, and raising and surfacing track where plowing is not possible are quite different from those used just five years ago. At that time the North Western was using an 80-man gang for this work. Today it is using a 37-man special tie gang and a 19-man ballast gang, completing about 3,600 ft of track per day. The production of completed track of the former 80-man gang averaged from 2,300 ft to ½ mile per day. Thus the road is doing about 37 per cent more work today with 56 men as it formerly did with 80. The output per man-hour has been increased from 4 to approximately 8 track-feet per man-hour.

In consist and equipment, the ballast unit of this gang is practically the same as that used in the road's 19-man surfacing gang which raises and surfaces track behind the special tie gangs. Also, the daily production of the two organizations is about the same. Ballast for this gang is unloaded by the local maintenance gang.

Where overhead bridges are encountered and existing clearance is restricted, the road uses a Kershaw Undercutter, together with a Ballastex-Screenex combination, to cut down the subgrade in advance of the plowing. Each pass of the Undercutter lowers the subgrade as much as 5 in, depending upon the machine setting, until the desired elevation is reached. The Ballastex-Screenex combination picks up the cuttings where left by the Undercutter.



TRACK LINING is done by one man on tangents using lining machine with wire-type "sighting" device.

BALLAST REGULATOR is used for spreading ballast for tamping purposes as well as for putting finishing touch to track.

- More machines
- Reorganization
- Better supervision

Hike rail-gang output

SPIKES ARE SET by hand but two dual spike drivers, powered by two track-mounted compressors, drive the spikes down.

● The largest extra gang on the North Western is its 85-man rail-laying gang, which handles the new rail and part of the relay-rail programs. It is geared for high production when laying the 78-ft rail lengths. On single track this gang will lay under traffic an average of 3,800 track-feet per day. On a dead track it will lay one mile or more of track per day.

This rail gang is another unit where the output per man-hour has been considerably increased as compared with the organization used five years ago. The rate of production per gang-day is about the same, but the former gang employed 110 men. Since then the man-hour output has been increased through the use of more machines, a reorganization of the force and better supervision.

For instance, in 1954 it was not infrequent for some of the operations at the front end of the gang to delay those following. This was particularly true with respect to the tie-adzing operation which was held up at times by the 10 men used for lowering the ballast in the cribs. Also, the rail-laying operation kept crowding the four to five sets of gagers. The use of two Nordberg Ballast Routers and a self-propelled Dun-Rite gager and a pregager brought harmony between operations.

Today's rail-laying gang is comprised of a general foreman, 3 extra-gang foremen, a timekeeper, 24 machine operators and 56 laborers. The local welder and his helper also accompany this gang. Work equipment furnished the gang includes two Raco track wrenches, two Nordberg spike pullers, two Nordberg ballast routers, three Nordberg tie adzers, a Fairmont carbolineum applicator, self-propelled Dun-Rite gager, a pregager, a Meco rail layer, a Speed Swing or Burro crane, two Racor dual spike drivers, two track-mounted Tractairs and a Jackson Track Maintainer. The latter machine is to insure proper bearing of the rails on the ties.

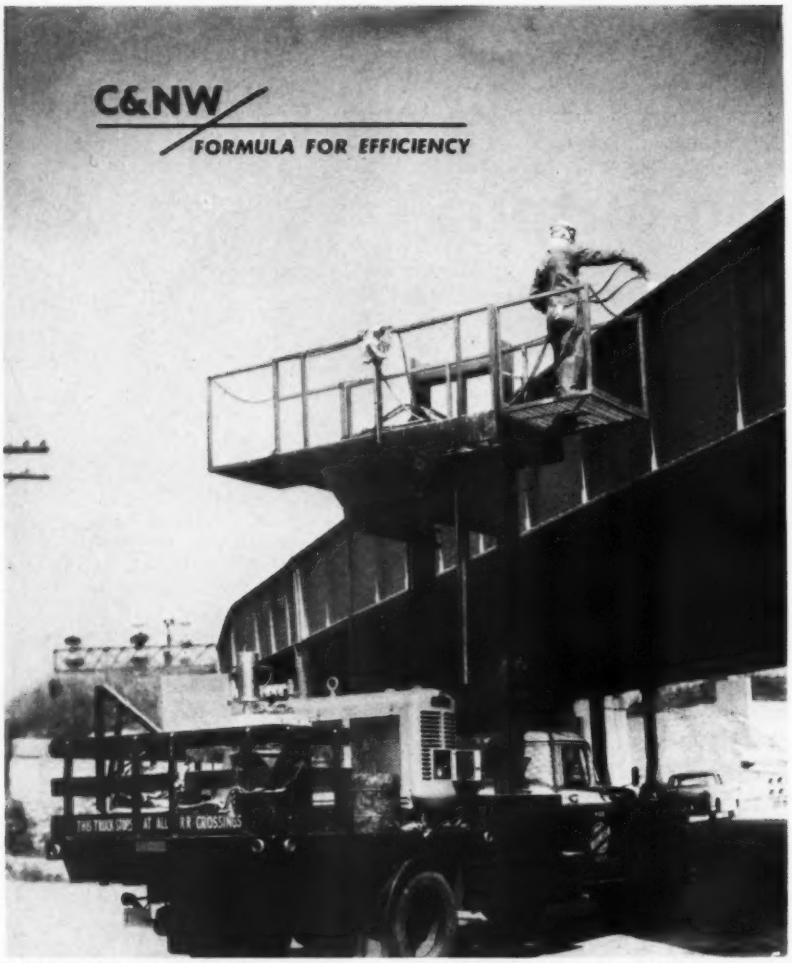
A smaller rail-laying gang of 35 men is used to relay useable rail on branch lines. Headed by an extra-gang foreman, this gang is comprised of 2 assistant foremen, a timekeeper, 9 machine operators, a welder and helper, and 20 laborers. It is equipped with a Speed Swing crane, spike pullers, adzers, power wrenches, Dun-Rite gager, dual spike drivers and a track-mounted Tractair. This gang is reported to average 2,360 track-feet of rail laid per day.

While considerable progress has been made with the mechanization of these operations, the road is constantly working with manufacturers to improve existing machines and to develop new ones to further reduce the man-power needs.

C&NW
FORMULA FOR EFFICIENCY

NEW RAIL, welded into 78-ft length, is laid by a Rail Layer at one end and a Speed Swing or Burro at the other.

USEABLE RAIL is left in 39-ft lengths. It is laid on branch lines and secondary mains by a rubber-mounted crane.



PAINT TRUCK was acquired for coating the 240 subway structures in the Chicago area. It is equipped with an elevating platform which rises from 5 to 15 ft above the pavement.

Machines, better planning spark up B&B forces

Careful planning, elimination of non-essential work, mechanization, new methods and practices all contribute to an increase in efficiency and production.

● In conformance with the North Western's policy, bridge and building work also is mechanized insofar as is possible and it receives the same careful budgeting as track work. All improvement items are scrutinized before inclusion in the capital budget and all approved maintenance items are shown on the functional budget.

Although an ample stock of timber is kept on hand for emergency purposes, the inventory of bridge and building materials is kept as low as is consistent. The purchasing department is given the full year's requirements in advance so it can arrange for orderly delivery of materials. However, in general, materials are requisitioned only from 60 to 90 days, depending upon the lead time needed for obtaining them, in advance of the work.

On the North Western a bridge and building gang means just that. These gangs, unlike many other roads where the gangs are specialized in one or the other type of structure, work on timber bridges, buildings, stock yards, etc., as required by their programs. However, the large part of their work is on bridges.

B&B gangs are division units which work all year 'round, with a reduction in the number of men per crew made during the five-month winter period. Work is planned to permit this, such as concentrating on the pile-driving work in summer and on deck work in winter. Building work is planned to be handled whenever a crew is in the vicinity.

The road also has three steel-bridge gangs which are system gangs. These crews handle both the improvement work and maintenance involving steel structures.

Most of these crews are housed in camp cars.

At the present time the C&NW has 70 division B&B gangs averaging 5.7 men each, including the foreman. This compares with 87 such gangs five years ago with an average of 8.4 men each, including the foreman. The three steel-bridge gangs have from 10 to 12 men each. This force compares with four steel-bridge gangs of the same size five years ago.

This reduction in force is attributed to several factors. The most important, of course, is that today's work is carefully planned a year in advance.

Another factor is more work equipment. Although the maintenance of

bridges and buildings does not lend itself to mechanized mass production as does track work, the road has constantly acquired machines which will increase production per man-hour for its B&B gangs.

Today, most of these gangs are equipped with a 2-ton truck having a hoist for dumping, a hand-operated winch, canvas top and folding side seats. Also, most gangs have a 2.5-kw permanent-magnet type generator, 24-in electric chain saw, 8½-in circular saw, ¾-in heavy-duty electric drill, ¾-in electric-drive impact wrench, 50-gpm electric sump pump, and electric grinders, as well as ropes, blocks and small hand tools. In addition, they have a heavy-duty type motor car, and most are equipped with a Fairmont 1½-ton derrick car with a 13-ft boom.

Also available on each B&B supervisor's territory is at least one 125-cfm Tractair with flanged wheels and a full assortment of air tools. Each division also is equipped with a Pettibone-Mulliken Speed Swing. Several of the divisions also are equipped with a Moto crane which can be moved around where needed at highway speeds.

ABOVE—Electric saw speeds timber cutting. Powered by an electric generator, it is one of several power tools used by B&B gangs.

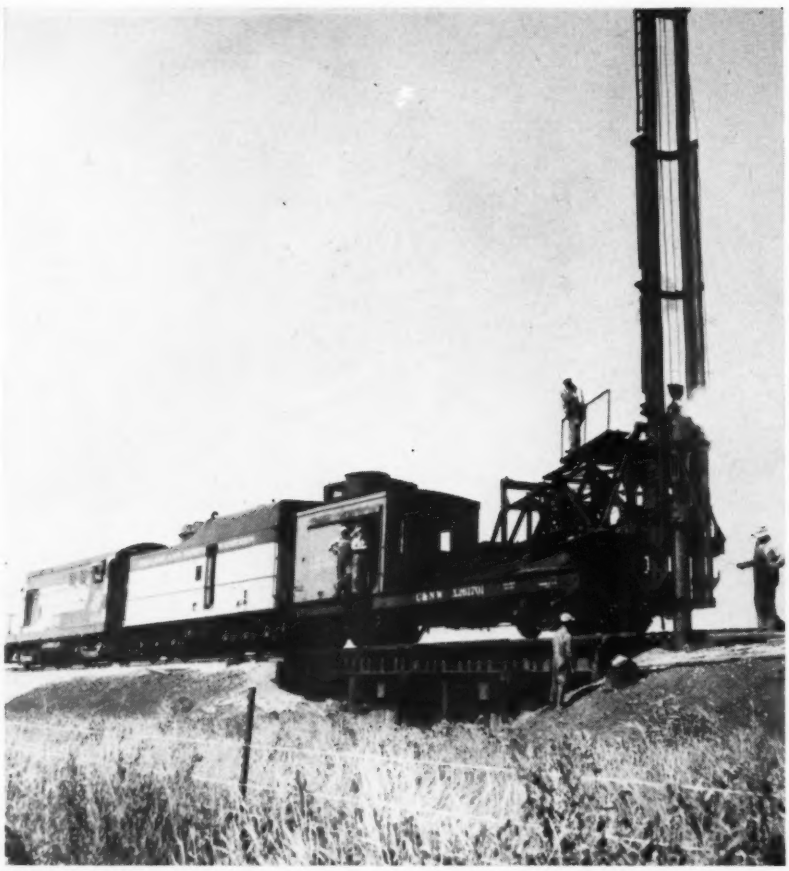
RIGHT—Lifting of heavy timbers and other loads is made easier by using a derrick car having a 13-ft boom.

BELOW—This crew finds that hand tools are just as indispensable in getting bridge work done as power tools.

Unit cost of painting reduced

Another factor is the adoption of a new bridge-steel protective coating and paint-spray equipment which substantially increase the output per man-hour and reduce unit costs. Up until 1958, the North Western used brush-applied red lead and standard black oil-base bridge paints. Confronted with the task of repainting over a million square feet of surface on its Boone, Iowa, viaduct—reported to be the longest and highest double-track bridge in the world—the road decided to use a new aluminum-pigmented drying-type coating. Designated No-Ox-Id A-Z, the material effected considerable savings in the surface preparatory work because it adheres well to old paint and required only the removal of loose rust, and other extraneous material, before application. It also is designed for a one-coat spray application. For this the road uses Binks low-mist spray equipment, supply-drum equipment and a pipe distribution arrangement which not only saved coating material but also reduced labor costs.

In addition to the labor savings



DRIVING PILES is frequently done with a steam-driven pile hammer with the steam supplied by a steam-generator car.

made in the application of this coating, the road achieved further savings by using powered scaffolding, called Spider Staging, for the painters. These consist of open cages which are raised and lowered on a single wire cable winding on a drum driven by an air motor beneath the cage floor plates. They can be raised and lowered at speeds varying up to 30 ft per min. Each cage has a capacity of 1,000 lb and is 28 in by 36 in. in area and 5 ft 9 in high. The road purchased 12 of these power stagings, along with several adjustable platforms. The stagings effected substantial savings in labor and they are now used in lieu of bo'sun's chairs, swing stages and temporary platforms.

Another means for reducing unit costs of painting is afforded by a new 1½-ton paint truck which the road devised for coating the 240 street subway structures which it maintains in the Chicago area. This truck has an elevating platform which raises and lowers hydraulically from 5 ft to 15 ft above ground. By setting up barricades, the truck can be moved from one point to another on the pavement for painting a structure from the platform. The elevating controls are on a 4-ft by 8-ft platform which can be widened to 14 ft.

The truck is equipped with a 125-cfm air compressor to permit the use of air tools. It also carries a Binks 8-to-1 material-handling spray pump, drum agitator, transfer pump, an electrical band-type drum heater with a 2.5-kva generator, street barricades, and a hydraulic hoist for lifting the drums from the ground to the truck. Compartments are available on both sides of the truck for carrying hose, fittings, small tools, tarpaulins, etc. For safety precautions, the truck has an oscillating red light on the roof of the truck cab and red lights on the sides of the platform.

Types of pile drivers

The road has five Industrial Brownhoist self-propelled steam pile drivers for conventional pile driving, and a 75-ton oil-burning steam pile driver for hard-driving use, as with concrete piles. It also has a steam-generator car, on which a 25-kw electric generator and a Worthington 50-cfm air compressor are mounted, which frequently is used to reduce work train expense. In addition, it has an American 30-ton locomotive crane equipped with a D-12 diesel Del-Mag hammer, which is self sufficient and eliminates the need for a locomotive. The latest pile driver, acquired in 1958, is a Harnischfeger crawler crane with a D-12 Del Mag diesel hammer which operates off track.

How grading and ditching programs are handled

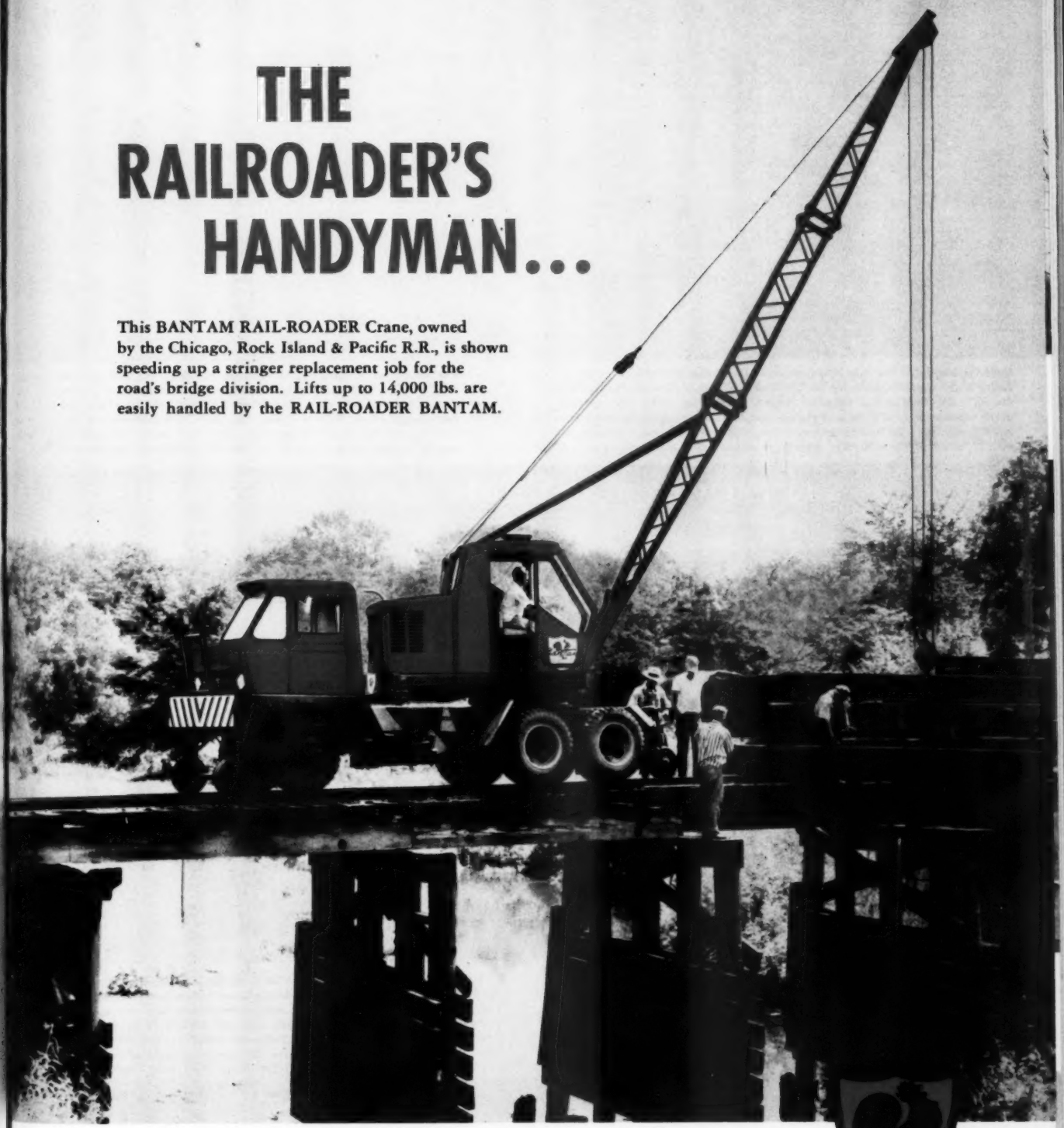
Grading and ditching work on the North Western is requested by the division forces, who also advise of the benefits which can be expected from each job. The recommendations are submitted to the engineer of maintenance, who weighs the benefits and decides what work can be done by the available equipment which, in general, is for system use. However, Jordan spreader-ditchers are available for work on all divisions.

The railroad has acquired a large number of earthmoving units of various makes. These include tractors, ranging from 38 to 175 hp scrapers, Speed Swing loaders, motor graders, and crawlers and rubber-mounted cranes. Accessories include bulldozers and angledozer blades, pole-hole drilling attachments, front-end loaders, snow plows, winches, and dragline and clamshell buckets.

Currently, the railroad is concentrating on the back sloping of cuts so that winds will keep the snow in motion and from piling up in cuts. Other important work includes the restoration of shoulders on fills, the cleaning of right-of-way ditches, channel relocation and cleaning, and the construction of driveways for railroad trucks and off-track equipment. Wherever possible, the road uses off-track equipment to eliminate work-train service.

THE RAILROADER'S HANDYMAN...

This BANTAM RAIL-ROADER Crane, owned by the Chicago, Rock Island & Pacific R.R., is shown speeding up a stringer replacement job for the road's bridge division. Lifts up to 14,000 lbs. are easily handled by the RAIL-ROADER BANTAM.



BANTAM RAIL-ROADER Crane

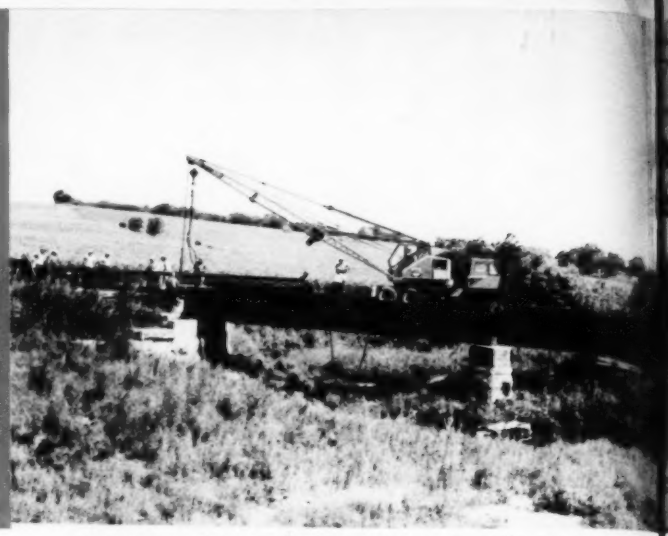
Speeds Work Schedules... Offers Greater Efficiency per Job

ON-TRACK OR OFF

Manufactured by SCHIELD BANTAM COMPANY, Waverly, Iowa

... world's largest producer of truck cranes-excavators

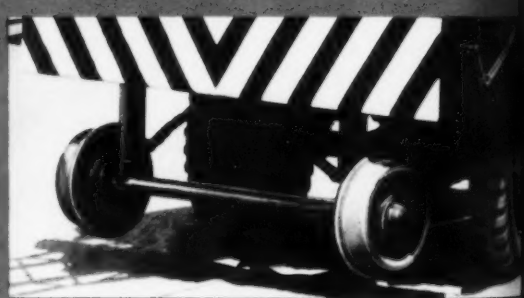
Restringing jobs like this 10-panel creosoted timber bridge are handled faster and more efficiently by the carrier-mounted BANTAM RAIL-ROADER Crane. BANTAM's big-machine capacity enables crew to remove entire double-bent, 4-timber stringers at one time, eliminating need for pulling core bolts to handle one member at a time. Job schedules speed up . . . productivity of bridge crew increases.



Redecking of 90-foot steel bridge moves ahead rapidly with the carrier-mounted BANTAM RAIL-ROADER Crane as it removes a section of rail preparatory to redecking operations. Removing old ties to a stockpile off the bridge (6 to 8 at a time), the BANTAM returns with a panel of new ties to be placed in position. One-man operation with BANTAM's remote control pays off on jobs like this, calling for frequent moves.

DOLLY WHEELS PROVIDE STABLE, DEPENDABLE RAIL MOUNTING . . .

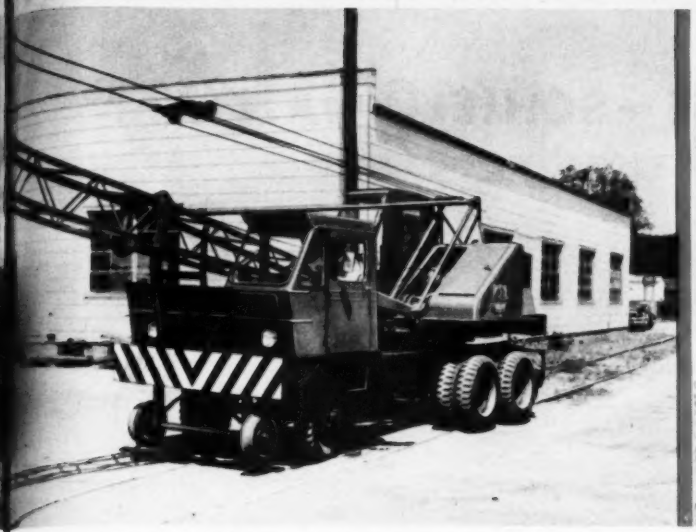
By combining the use of dolly wheels, both front and rear, with the rugged mobility of BANTAM-built crane carriers, the BANTAM RAIL-ROADER Crane equips you to handle any lifting or excavating, loading or placing job *on-track or off*. Rear dollies (left) are bolted to the rear outrigger assembly and operated up and down by means of a hand-crank. For travel off-track, the wheels retract fully, not interfering with normal road travel. When lowered into position, they provide a safe, accurate tracking system for the rear tandem axles of the carrier.



Front dollies (right) are mounted immediately behind the front bumper of the carrier and moved up and down by the hand-crank method. A special positioning gauge indicates the proper position for best on-track setting. Steering the carrier is not necessary when traveling on-track. The front dollies insure proper tracking through crossings, switches, and around the sharpest curves. A special high-speed reverse gearing system provides normal truck speeds (up to 45 m.p.h.) in reverse as well as forward.

Changing caps on main-line bridges is no longer the time-consuming job it once was. With the BANTAM RAIL-ROADER Crane this job is handled completely in a matter of a few hours. The BANTAM is used to lift the entire track bed, which is blocked into position. Then, by utilizing the inch-at-a-time accuracy of BANTAM's hoist line, the old cap is slipped out and the new one placed.

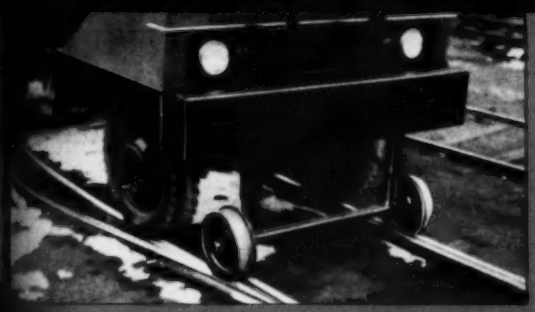
BANTAM's ability to travel with loads is demonstrated here as the carrier-mounted RAIL-ROADER BANTAM moves onto a bridge with a panel of 6 new ties. Positive control of moves with the remote-control-equipped BANTAM offers maximum safety as well as the economy of 1-man operation. Valuable job-time is saved by the BANTAM in stockpiling materials near the job site. On remote sections of right-of-way this means great time savings over handling and rehandling of materials.



Accessibility to the job is of prime importance in maintenance-of-way equipment. Here the crane carrier-mounted BANTAM RAIL-ROADER Crane moves on-track at a grade crossing more than a mile from the actual job site. No off-track access point to the job was available. A simple maneuver puts the BANTAM on-track and into position for lowering the dolly wheels. Traction is provided by the tires which rest on the tracks.

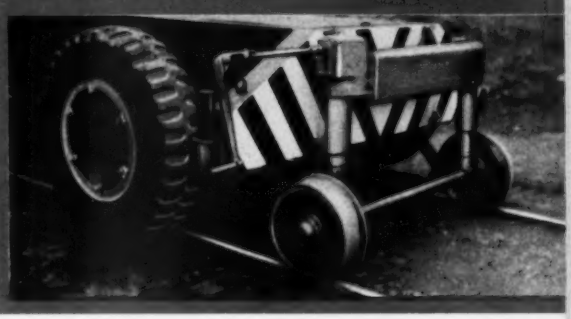
The BANTAM RAIL-ROADER Crane is also available as a self-propelled model. Here, the Model CR-35 BANTAM, equipped as a RAIL-ROADER Crane, is shown in travel across a bridge. Note that the front wheels (non-driving) are suspended above the track bed, eliminating danger of striking switches, crossings, etc., while in travel. A special reverse transmission system provides speeds up to 12 m.p.h. in either direction.

FOR EFFICIENT, HIGH-SPEED ON-TRACK PERFORMANCE



BANTAM's unique dolly-wheel mounting eliminates derailing danger when crossing switches, road crossings, etc. Photo at left shows front dollies crossing switch. Note truck tires ride *on* the rails, eliminating binding and tearing between switch rails. Rear tandem assembly, also riding *on* the rails, crosses switches and road crossings safely and effortlessly. This safe and efficient operating principle is offered on both the self-propelled BANTAM RAIL-ROADER Crane and the crane carrier-mounted model.

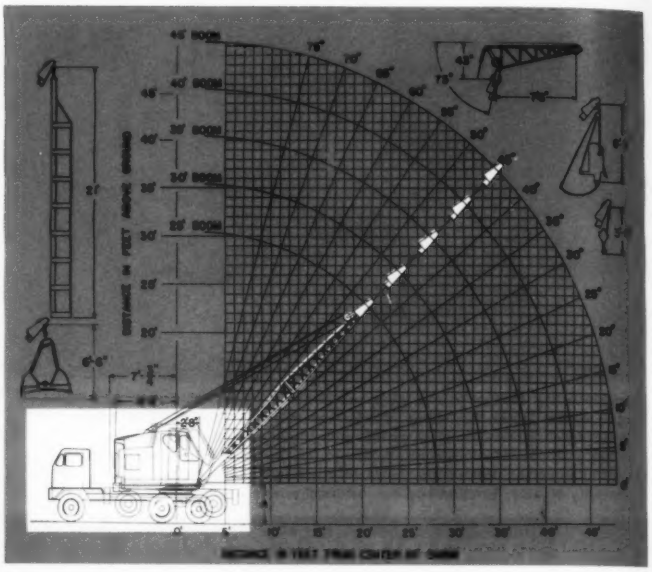
Pictured at right is the front dolly assembly of the Model CR-35 self-propelled BANTAM RAIL-ROADER Crane. Note that the only appreciable difference from the carrier-mounted version is that the front wheels are suspended in air to the outside of the rails, since they are not used for traction. (The Model CR-35 offers 4 x 2 drive.) Lockout bars on the frame prevent oscillation of the front axle during lifts over the side. The same hand-crank and positioning gauge are available for the CR-35 BANTAM as are used on the crane-carrier version.



Work range of the BANTAM RAIL-ROADER Crane is extended through use of 11 interchangeable front-end attachments, increasing productivity and savings even further with this one basic tool. Here the BANTAM is shown on-track, backfilling bridge ends with the clamshell attachment. The RAIL-ROADER BANTAM makes hand-labor savings obvious on jobs like this.

When not engaged in on-track work, the self-propelled BANTAM RAIL-ROADER Crane makes an ideal yard tool, handling stockpiling jobs like this . . . loading and unloading of construction and maintenance material . . . and virtually any job calling for lifting, digging or handling. Notice here how BANTAM's standard-equipment power boom hoist allows precision spotting requiring long reaches.

LIFTING CAPACITIES—SCHIELD BANTAM RAIL-ROADER Crane



FIGURES IN ORANGE INDICATE MODEL CR-35
FIGURES IN BLACK INDICATE MODEL T-35

Over End with Center and Rear Outriggers On or Off-Track (or On-Track without Outriggers)

Boom Length	25 FEET		30 FEET		35 FEET		40 FEET		45 FEET	
Model	T-35	CR-35	T-35	CR-35	T-35	CR-35	T-35	CR-35	T-35	CR-35
Radius										
10′	14,000	15,040								
12′	12,960	14,040	12,890	13,970	12,810	13,890				
15′	10,400	11,700	10,330	11,630	10,250	11,550	10,150	11,450	10,040	11,340
20′	7,620	7,686	7,550	7,616	7,470	7,536	7,370	7,436	7,260	7,326
25′	5,760	5,397	5,690	5,327	5,610	5,457	5,510	5,357	5,400	5,247
30′			4,290	4,785	4,210	4,305	4,110	4,105	4,000	3,995
35′					3,475	3,526	3,375	3,426	3,265	3,316
40′							2,960	3,054	2,850	2,824
45′									2,550	2,657

Over Side with Center and Rear Outriggers On or Off-Track (or On-Track without Outriggers)

Boom Length	25 FEET		30 FEET		35 FEET		40 FEET		45 FEET	
Model	T-35	CR-35	T-35	CR-35	T-35	CR-35	T-35	CR-35	T-35	CR-35
Radius										
10′	14,000	14,040								
12′	12,960	12,360	12,890	12,290	12,810	12,210				
15′	9,030	9,668	8,960	9,598	8,880	9,518	8,780	9,418	8,670	9,308
20′	5,460	6,771	5,390	6,701	5,310	6,621	5,210	6,521	5,100	6,411
25′	4,190	5,047	4,120	4,977	4,040	4,897	3,940	4,797	3,830	4,687
30′			3,350	3,961	3,270	3,871	3,170	3,771	3,060	3,661
35′					2,630	3,120	2,530	3,020	2,420	2,910
40′							2,110	2,459	2,000	2,349
45′									1,790	1,961

Over Side without Outriggers Off-Track (or On-Track with Duals Blocked)

Boom Length	25 FEET		30 FEET		35 FEET		40 FEET		45 FEET	
Model	T-35	CR-35	T-35	CR-35	T-35	CR-35	T-35	CR-35	T-35	CR-35
Radius										
10′	8,900	9,150								
12′	7,055	8,740	6,985	8,670	6,905	8,590				
15′	5,250	5,722	5,180	5,655	5,100	5,575	5,000	5,475	4,890	5,365
20′	3,610	4,081	3,540	4,019	3,460	3,939	3,360	3,839	3,250	3,729
25′	2,760	3,113	2,690	3,055	2,615	2,973	2,515	2,873	2,400	2,757
30′			2,060	2,373	1,980	2,293	1,880	2,193	1,770	2,080
35′					1,625	1,840	1,525	1,760	1,415	1,648
40′							1,265	1,464	1,155	1,351
45′									1,000	1,279

Over End without Center and Rear Outriggers (Off-Track Only)

Boom Length	25 FEET		30 FEET		35 FEET		40 FEET		45 FEET	
Model	T-35	CR-35	T-35	CR-35	T-35	CR-35	T-35	CR-35	T-35	CR-35
Radius										
10′	8,260	11,340								
12′	6,665	8,935	6,595	11,270	6,515	11,190				
15′	5,030	6,629	4,962	8,862	4,880	8,782	4,780	8,682	4,670	8,572
20′	3,655	5,005	3,585	6,758	3,505	6,678	3,405	6,578	3,295	6,468
25′	2,835	3,755	2,765	4,935	2,685	4,855	2,585	4,755	2,475	4,645
30′			2,160	2,961	2,080	2,881	1,980	2,781	1,870	2,671
35′					1,690	2,311	1,590	2,211	1,480	2,101
40′							1,340	1,837	1,230	1,717
45′									1,115	1,390

Over Side without Outriggers On-Track (with Outside Duals Unblocked)

Boom Length	25 FEET		30 FEET		35 FEET		40 FEET		45 FEET	
Model	T-35	CR-35	T-35	CR-35	T-35	CR-35	T-35	CR-35	T-35	CR-35
Radius										
10′	7,585	7,750								
12′	6,070	7,030	6,000	6,960	5,920	6,880				
15′	4,690	5,470	4,615	5,400	4,540	5,320	4,435	5,220	4,325	5,110
20′	3,305	4,270	3,235	4,200	3,155	4,120	3,055	4,020	2,945	3,910
25′	2,490	3,250	2,420	3,180	2,340	3,100	2,240	3,000	2,130	2,890
30′			1,995	2,100	1,915	2,020	1,815	1,920	1,705	1,810
35′					1,490	1,620	1,390	1,520	1,280	1,410
40′							1,075	1,300	965	1,190
45′									765	

NOTE: Due to its policy of constant product improvement, Schield Bantam Company reserves the right to change any specification without notice, or without incurring obligation for any units previously sold.
For complete specifications and BANTAM features, see Bulletins No. TCR-202 (carrier-mounted BANTAM) and CR-502 (self-propelled BANTAM).

World's largest producer of truck cranes-excavators

SCHIELD Bantam® Co.

284 Park Street, Waverly, Iowa, U.S.A.

WRITE OR WIRE FOR COMPLETE DETAILS.

A NEW COLOR MOVIE of the BANTAM RAIL-ROADER Crane in action will open your eyes to the many ways this versatile machine can save time and money in right-of-way construction and maintenance as well as yard work. Let us arrange a showing at your convenience.

Keeps bridges in good repair

Two independent detailed bridge inspections are made annually to assure safe structures. Maintenance is reduced by installing culvert pipe and filling bridges.

● The North Western has over 150 track-miles of bridges and over 20,000 culverts to maintain. Approximately half of the bridge mileage consists of 2,821 metal structures. The majority of these is made up of deck-plate girders, through-plate girders, through-plate girders with ballasted decks, truss spans and subway structures. In the late 'Thirties the road also built a number of reinforced-concrete pile and slab structures, with ballasted decks, over highways. For a number of years, the road's design standard for bridges has been Cooper's E-72 loading, except for a few minor branch lines where the rating is E-60.

The most recent activity in the construction of new bridges is brought about by the building of several expressways under the tracks in the Chicago area. This is in addition to many grade separation structures under construction throughout the system. Although these are primarily the responsibility of governmental agencies, the road must check and approve all plans and check the work being done as it is progressed. Also, many of them require considerable alteration to existing facilities.

For pile trestles the road's standard specifies 13-ft spans, 14-in by 14-in caps, three 8-in by 16-in stringers per chord, and 8-in by 8-in by 10-ft bridge ties.

Each year the bridge mileage is whittled down to reduce maintenance. This is the result of a long-standing policy of questioning the size of a waterway opening whenever a bridge comes up for renewal. After investigation it is frequently found that the bridge can be replaced with a culvert pipe and fill. For 1959, about 140 spans will be filled and replaced by pipe. In general, these projects add up to the major portion of the capital budget for bridges.

The road has six tunnels, the longest of which is 3,822 ft long and is located between Elroy and Sparta, Wis. It also has a number of masonry arch culverts, many of which have been strengthened by lacing metal culvert plates through them and grouting between the metal plates and the old arches.

Bridges inspected twice annually

Nothing is left to chance with respect to bridges on the North Western. Every structure is inspected at least twice each year. Once during the year the road's general bridge inspector examines every bridge on the system. He makes notes on the condition of each bridge structure and the extent of any work required for its maintenance or improvement. In addition, during the fall of the year, a joint inspection is made by the division engineer and supervisor of bridges and buildings. These men make a detailed inspection of each structure, both bridges and culverts, as well as tunnels, and agree on the work, if any, which should be done during the following year. Their recommendations, which also include capital improvements, as when changing the type of structure, are forwarded to the engineer of bridges.

The engineer of bridges compares these recommendations with those submitted by the system bridge inspector. After a decision is made on the extent of the work to be done on each structure, an AFE for capital-account items or a bridge maintenance order (BMO) is developed. For steel structures and all capital account items, the bills of materials and requisitions are prepared in the office of the engineer of bridges. The BMO shows the maintenance work authorized and also the amount of timber required. The supervisor of bridges and buildings, in planning his year's work, places these work items on his functional budget.

In the spring, a third inspection of all structures on which work is to be made by the supervisor of bridges and buildings to check the conditions of the bridges after the winter season. At this time he also checks his bill of material for jobs which have been authorized but not yet started.

KNOWN as the longest and highest double-track bridge in the world, this viaduct at Boone, Iowa, has a large surface to paint.

C&NW
FORMULA FOR EFFICIENCY

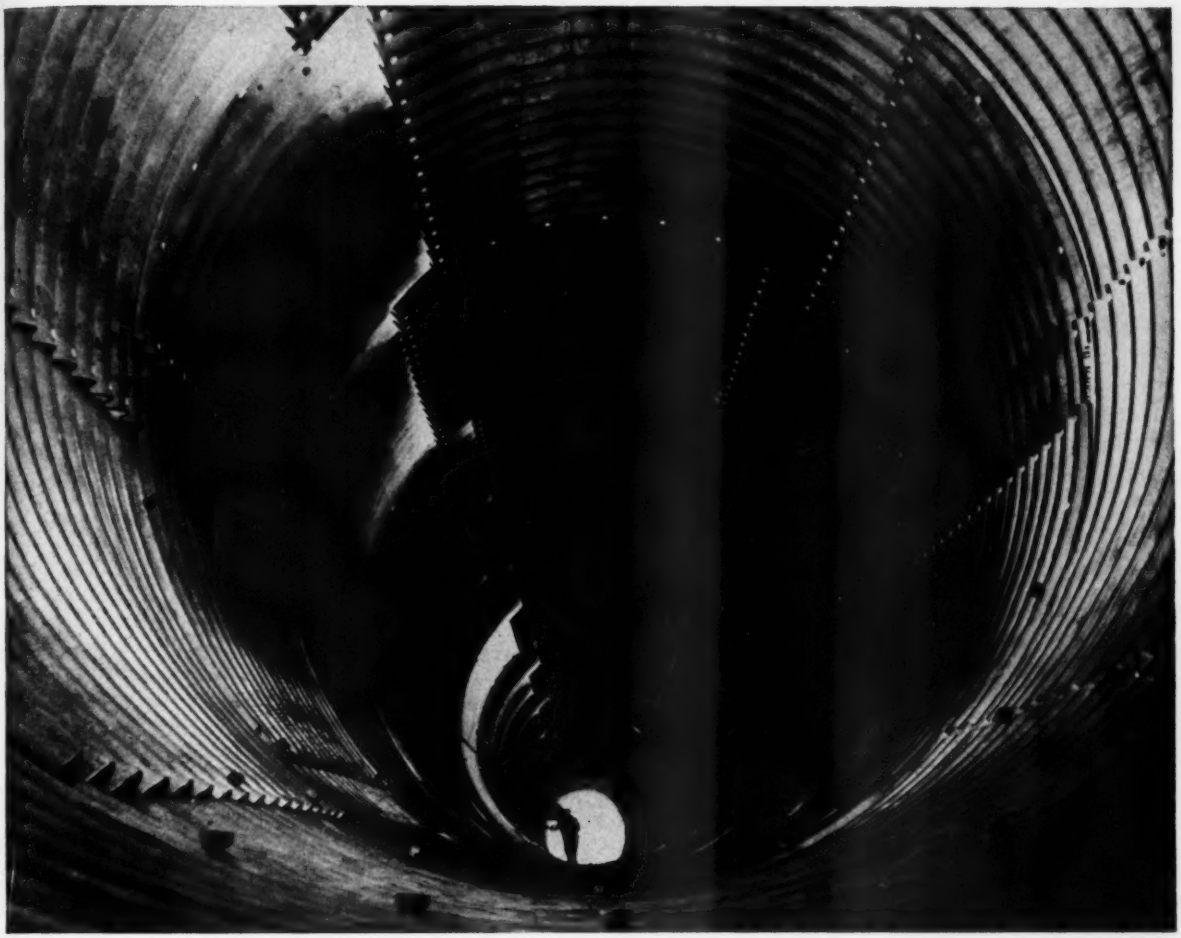
NEW CAR SHOP at Clinton, Iowa, presented the North Western with its largest building project in recent years. Built in 1957, these facilities permit the road to consolidate repairs formerly done at 14 different points. Cost was about $5 million.

Low maintenance is goal for buildings

Many old structures requiring costly maintenance are being replaced by new buildings housing several functions. Installation of IBM machines for data processing has required construction of several new buildings which are mostly of the prefabricated type.

● Most of the building activity on the North Western during the past year has been in connection with the installation of IBM machines for an Integrated Data Processing (IDP) system at 68 locations. Where new structures were built, most of them are Armco prefabricated structures with air conditioning and require little maintenance.

In general, such structures are designed to include other functions besides housing the accounting machines. For example, at Cameron, Wis., the building also serves as a depot. At Mason City, Iowa, St. Paul, Minn., Norfolk and Fremont, Neb., the new buildings also include yard offices. At Cedar Rapids, Iowa, the new structure serves as a depot, yard office and includes an office for the roadmaster and trainmaster. The most



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Bridge construction with Armco Corrugated Metal Drainage Structures offers three advantages you can measure. Consider these facts: Bridging a stream or ravine with an Armco Structure plus an embankment saves money. The "bridge" is mostly earth! Secondly, it saves time. Modern earth-moving methods make short work of backfill. Third, maintenance is practically eliminated. Compared with a trestle, there is very little to maintain. Write us for authoritative data or assistance with your construction problem. Armco Drainage & Metal Products, Inc., 4379 Curtis Street, Middletown, Ohio. In Canada: write Guelph, Ontario.

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Subsidiary of ARMCO STEEL CORPORATION

OTHER SUBSIDIARIES AND DIVISIONS: Armco Division • Sheffield Division • The National Supply Company
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TYPICAL of the new prefabricated-metal structures being erected at various points on the railroad is this one at Waukegan, Ill.

Usually, the road tries to include several functions in one building so that some of the older structures can be eliminated.

COMBINATION yard office, Integrated Data Processing headquarters, agent's office and welfare facilities are housed in this modern structure at 40th Street yard, Chicago.

Low maintenance for buildings (cont'd)

recently built structure, at Waukegan, Ill., houses a freighthouse, a yard office, welfare facilities, a trainmaster and a roadmaster. By so combining several functions, the road is able to eliminate some of the older structures and thus reduce maintenance.

Where permanency is assured, as in the Chicago terminals, buildings of brick, with concrete-block partitions, are erected. Such structures include a new potato-brokerage office building and telephone building at Wood Street yard and a new yard office at the road's 40th Street yard. Three yard offices at its Proviso yard are under construction.

One of the largest building projects of recent years was necessitated by a consolidation of all car-repair facilities at Clinton, Iowa, to permit assembly-line procedure. This is a modern car-repair shop with related facilities costing approximately $5 million. The project, placed in operation in 1957, includes a new erecting and fabricating shop, 1000 ft long and 60 ft wide, and a paint shop 400 ft long and 60 ft wide. These are mostly of bolted structural-steel construction, with roof and sides covered with Robertson Galbestos metal siding, and with alternate vertical panels of translucent corrugated fiberglass impregnated with resin. A welfare building, to accommodate 500 employees, was constructed of concrete block with a prestressed Flexicore type of roof.

In addition to the construction of new buildings, the IDP system necessitated alterations to buildings at many locations. Diesel houses also came in for some remodeling because of changing from steam-heating systems to hot-air space heaters.

Plan to retire old buildings

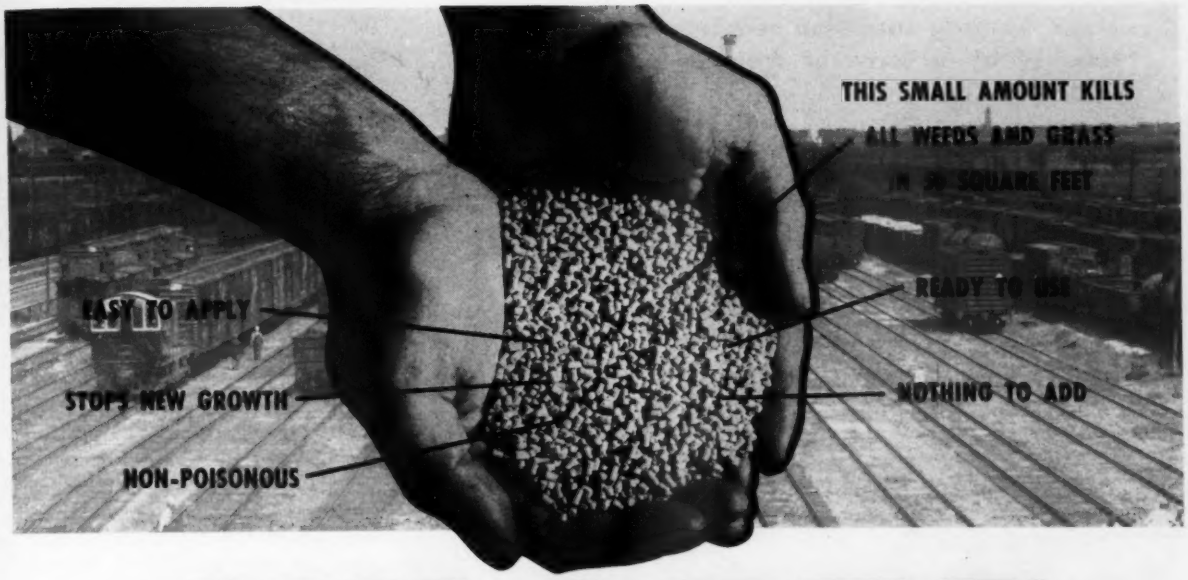
To cut down on maintenance costs, the C&NW is making a special effort to remove and retire as many of its old buildings as possible. It is now in the process of determining what structures are necessary and must be retained. This study is of added importance at this time because of the fact that many of the road's station agents are handling the business at more than one station. Many stations are now larger than required and offer the possibility of reducing the areas. Whenever such structures require extensive work they are being replaced with metal type prefabricated buildings of a size more suited to the requirements.

Consequently, this has tended to sharpen the interest of all responsible officers in questioning the need for existing buildings. Whenever any extensive repairs or alterations are required on a structure, the need for the building or for its present size is first established.

Inspections of buildings are made by the division officers as they cover their territories. Building maintenance is now scheduled by months on the functional budget the same as track maintenance.

PROVEN

WEED & GRASS KILLER



CHLOREA® GRANULAR

CHLOREA GRANULAR is a pelletized weed and grass killer. The pellets are ready for use . . . no mixing or adding of water is required. Application is easy to make with simple equipment, or by hand. These important advantages combined with powerful "kill all" effectiveness have been fully demonstrated by extensive use on many leading railroads.

Here are the important facts about Chlorea Granular:

1 Kills ALL weeds and grasses . . . stops new growth for a year or more.

2 Particularly intended for use where large scale spray application is impractical . . . such as freight yards, terminals, storage yards, under bridges and trestles, around warehouses, stations and other similar places.

3 Easy to use . . . apply with any mechanical type of granular material spreader; or broadcast by hand.

4 Low application rate . . . about 400 pounds to the acre . . . less where only annual vegetation is involved.

5 Contains 3 proven chemicals . . . this combination kills deep rooted weeds and grasses, as well as shallow rooted grasses, weeds and annual seedling growth.

SEND FOR FREE SAMPLE PACKET

CHIPMAN CHEMICAL COMPANY

World Leader in Chemical Weed Control Since 1912

RAILROAD DIVISION HEADQUARTERS

Dept. 6 A, 608 South Dearborn St., Chicago 5, Illinois

Year 'round work on

Growing work-equipment fleet

Keeping track scales and M/W machines in good working condition requires constant maintenance by a force of trained mechanics. The C&NW has it.

Work Equipment Purchases

Year		Expenditure
1953		$ 431,725
1954		555,850
1955		599,281
1956		565,344
1957		1,185,338
1958		1,312,550
1959	(Budget)	1,224,050

C&NW
FORMULA FOR EFFICIENCY

● Firmly convinced that machines will lower unit costs, the C&NW has a hefty investment in work equipment. In the last six years only (see accompanying table) the road has purchased over 1,800 units at a cost of about $4 million. And its plans for 1959 include a further expenditure of over $1 million for machines for the way and structures department.

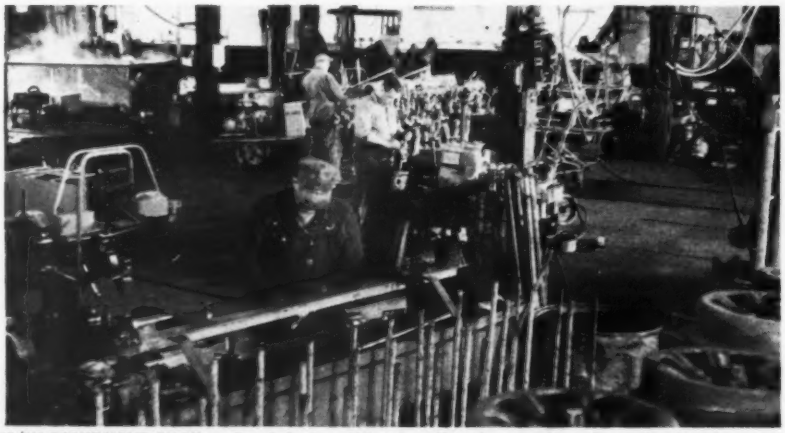
Knowing that machines are useless unless kept in good operable condition, the North Western employs a sizeable force for maintaining its work equipment. It also maintains two shops, a large one at Fond du Lac, Wis., and a small one at Sioux City, Iowa, where the equipment may be overhauled and repaired.

Headed by an engineer of scales and work equipment, this sub-department includes a supervisor of scales and work equipment, 2 work-equipment shop foremen, 7 traveling scale and work-equipment inspectors, an automotive inspector, a scale-shop foreman, and 8 division scale inspectors. In summer, it also includes 3 machine operators and 6 assistant machine operators who operate Fairmont W-77 Ballast Maintenance cars on a system scheduled basis. Each of these machines averages about 3,000 miles of track per year, disking and scarifying.

The scale-shop foreman makes repairs to scale parts in the shop, tests scales in the field, and supervises any new installations. To facilitate testing of track scales he has three test cars which he keeps moving from point to point. He is aided by the eight division scale inspectors and, during the off season for track work, by the seven traveling scale and work-equipment inspectors. In all but one of the states through which the railroad operates, the track scales are tested by railroad forces. In Minnesota, which has its own scale inspectors and test cars, a railroad scale inspector is present when the state inspectors make their tests.

The automotive inspector inspects railroad - owned automotive vehicles and makes some repairs to them and, as time permits, to work equipment.

The seven traveling scale and work-equipment inspectors are field mechanics who inspect and make field repairs to all types of work equipment. Part of their duties is to keep ma-



M/W EQUIPMENT SHOP at Fond du Lac, Wis., handles the repair and overhaul of most of the road machines. A smaller shop at Sioux City, Iowa, also does some of this work.

TRAVELING scale and work-equipment inspectors have a mobile shop in which they carry an electric generator, electric tools and other equipment for making field repairs.

A-W Hydraulic Crane transports two 2500-lb. wheel and axle sets four times as fast in GM&O's Venice, Ill., repair yards. One set is carried on the boom, the other on front-end load-carrying platform.

Gulf, Mobile & Ohio nets $40,000 savings annually with two Austin-Western Hydraulic Cranes

Two Austin-Western Hydraulic Cranes do the work of 10 men and a tractor in Gulf, Mobile & Ohio's Bloomington and Venice, Ill., repair yards.

GM&O reports," . . . we have an annual gross labor and equipment saving of $50,000* because of the A-W cranes. The cost of our two cranes is estimated at less than $10,500 annually for both. Deducting the cost of the small tractor, crane costs are reduced to less than $10,000. The net saving in the cost of car repairing in a year is over $40,000!

Safety factor important

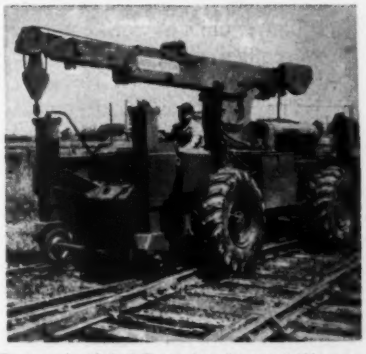
"Changing car doors and setting couplings, difficult and dangerous hand operations, are now done safer and faster by crane. The factor of extra safety alone probably justified use of the A-W, even if it did not also make such worthwhile savings.

"When our 25-ton locomotive crane was out of service for 10 days, the 5-ton A-W unit handled most of the essential jobs. During 1957 the A-W crane worked two shifts daily for 5 months rebuilding 400 hopper cars. Equipped with magnets on the 18-ft. telescoping booms, the A-W's keep the yards free of dangerous scrap metal.

Maneuverable, versatile

"The A-W is so maneuverable that it makes its way readily anywhere under all conditions. In spite of snow 18 in. deep and temperatures 6° below, the A-W stayed on the job in the unpaved repair yards at Venice. With all-wheel steering it can turn in less than its own length. Boom swings a full 360°. With all-wheel drive the A-W easily runs over raised rails.

"Several times a day the crane is used to spot cars, nosing them along with the boom end. There seems no limit to the chores we can do faster and more safely with the Austin-Western Hydraulic Crane!"



Equipped with Rail Crane Attachment, A-W crane can work on-or-off-track with equal ease.

**For complete information about the self-propelled A-W Hydraulic Crane in GM&O's operations, write today for Certified Gould Report No. 5801.*

Austin 1859 AUSTIN-WESTERN 1959 100th YEAR PARTNERS IN PROGRESS **Western** CONSTRUCTION EQUIPMENT DIVISION AURORA, ILL.

BALDWIN · LIMA · HAMILTON

Power graders • Motor sweepers • Road rollers • Hydraulic cranes

BALDWIN BLH LIMA-HAMILTON

Growing work-equipment fleet (cont'd)

chines used by the road's extra gangs in good operable condition. Two accompany the large rail-laying gang, one and sometimes two inspectors travel with the ballast gang using the undertrack plow and one with each tie gang.

Each of the traveling scale and work-equipment inspectors is furnished with a 1-ton panel-body truck. This vehicle serves as a mobile shop. It carries a portable gas-engine-driven electric generator, electric drills, impact wrench, and other electric tools. In addition it carries a complete set of sockets, vacuum gauges, timing lights for checking timing, compression gauges for checking cylinders, valve-grinding kits, and many small parts, including a complete set of hydraulic hoses and fittings. Another important item, which is carried in a rack on the roof of the truck, is a portable tripod with hoist for lifting heavy parts.

The Sioux City shop is a small m/w equipment shop. It employs a foreman and 4 men in summer and 6 men in winter. This compares with a foreman and 21 men in summer and 23 or more men in winter at the large shop at Fond du Lac. In general, the Sioux City shop overhauls and repairs all railroad-owned Fairmont W-77 and M-23 Ballast Maintenance cars and all motor cars operated on the western portion of the railroad. It also handles some of the automotive equipment repairs on western lines. All other units of work equipment are overhauled and repaired at the Fond du Lac shop.

The latter is located in a former roundhouse which provides tracks and ample space to disassemble large machines and keep the parts close at hand. The incoming machines are steam-cleaned outdoors before overhaul and, indoors, a degreasing vat is available for cleaning the smaller parts. A machine shop, fully equipped with the machines necessary for the repair of all types of work units, is provided. A stock of the more frequently required parts also is available in an adjoining storeroom. However, this stock is kept at a minimum by permitting direct ordering on manufacturers for replacement parts.

The engineer of scales and work equipment investigates all new machines as they are introduced on the market and furnishes detailed reports so their practicability for use on the North Western can be determined. He also follows up all improvements made to existing equipment.

All new units of equipment are entered in the equipment records and each is assigned a railroad number. The performance and repairs made on each unit are also entered on the machine's record card. Each time a machine is shipped, received at a new location, or scrapped, a Form 1309 is made out and forwarded to the engineer of scales and work equipment for his record. Copies are also made for the local division engineer, the consignee and the shipper.

The engineer of scales and work equipment has a wall chart to serve as a ready reference on the location of every unit of work equipment on the railroad. Each one of the vertical columns on the chart covers a certain type of equipment. For example, there is one for the 12-tool Jackson Multiple Tampers, another for the 16-tool Jackson Track Maintainers, and another for the 16-tool RMC Tie Tampers. The horizontal lines show the total number of units owned, number on hand at Fond du Lac shop, number on hand at the Sioux City shop, and the number of units charged to each division engineer, roadmaster, supervisor of bridges and buildings and supervisor of signaling.

Each unit in each category is represented by a pin having a distinctive colored head. By having a person responsible for moving the pins in accordance with the information received through the Form 1309 reports, the chief engineer, engineer of maintenance, process engineer, or anyone desiring the information, can quickly determine where the units are located.

Two types of material-handling machines . . .

RIGHT — Off-track mobile cranes are available on every division for track, bridge, building and signal work.

BELOW — Cribber and on-track crane team up to remove old ballast from track so fresh ballast can be applied.

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Strategically located from coast to coast, ready to serve your needs promptly and efficiently.

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An important part of this service lies in making available to railroads a wealth of Racor engineering experience—*practical* experience that comes from many years of designing and manufacturing trackwork and specialties . . . *advanced* experience that is helping solve tomorrow's railroad problems today in Racor research laboratories . . . *rounded* experience that has been tested and proven in countless trackwork installations throughout the United States and Canada.

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CROSSING-PROTECTION program—a two-year project—now is practically completed at a cost of about $4.5 million. New protection and improvements were installed at a total of 330 crossings in eight states. It will save about $2 million annually.

Signal forces meet new challenge

C&NW completes a two-year highway crossing-protection project which affords better protection and will produce substantial savings in operating expenses. When an insufficient number of additional employees proved hard to obtain, the existing forces enabled the work to be completed on schedule through a special working agreement.

● The last two years have brought a great deal of activity to the signaling forces. The primary reason for this is a plan, started January 1, 1957, to install new or improved crossing protection facilities at 330 highway crossings in eight states. This plan not only provides better protection but it also eliminates a large number of crossing watchmen and gatemen.

Practically completed at the end of 1958, this program cost approximately $4.5 million, of which the railroad's portion was about $3.6 million. On the other hand, the railroad will now effect savings of about $2 million each year on the wages and fringe benefits of the displaced crossing watchmen and gatemen. This represents a return of more than 55 per cent on the investment in these improvements.

Needless to say, this new program placed a heavy load on the existing forces. They are geared to handle normal construction and maintenance. They maintain the automatic block system on 605 miles of single track and 2,204 miles of track in multiple track territory; automatic train stop on 379 miles of track; train-control systems on 1,034 miles of track in multiple-track territory; and CTC on 167 miles of track in multiple-track territory. In addition, there are 127 interlocking plants and a large number of existing highway crossing-protection installations to maintain.

At the time this program was initiated, the C&NW had about 125 signal construction men. Careful estimates indicated that at least 175 signal construction men, working 40 hours per week, were required. A few additional men were employed through intensive searching and national advertising. When it was apparent that not enough additional men could be obtained, a special agreement was reached by the railroad with the Brotherhood of Rail-

NOW YOU CAN PLOW ON DOUBLE TRACK . . . . . like the

CHICAGO AND NORTH WESTERN SYSTEM

Front end view of Double Track Plow. Note that plow blades move in one direction only.

Plow in position under the track. The jacks holding the track will be removed.

Double Track Plow in operation. All the foul ballast is carried to the outside shoulder by the "one way" blades.

Now the MANNIX PLOW has been still further developed to plow on double track. 3,159 feet of track cribbed in less than two hours . . . that's just one example of the way it saves money for the Chicago and North Western! Today, send for details of the MANNIX Plow-and-Sled method of track maintenance. Ask about the contract plan available for the use of this patented equipment.

MANNIX INTERNATIONAL INC.

4020 Minnetonka Boulevard, Minneapolis 16, Minnesota
Phone: WAlnut 7-9411

Signals (cont'd)

road Signalmen of America to work the existing crews more than 40 hours per week. Without this, the work would not have been completed within the scheduled time.

In addition to this highway-crossing improvement program, another project of importance was the re-signaling of one of two tracks in double-track territory where 34 miles of one track were taken up. The signaling was revised to make it applicable to train operation in both directions. A similar project, 37 miles long, is scheduled for 1959. Plans are now being made for the elimination of a second main track and for the installation of CTC. The first of these projects, involving about 165 miles, will be started in 1960.

Also scheduled for 1959 is the consolidation of four interlocking plants into one. This is in the Chicago area where the construction of new expressways necessitate the relocation of tracks.

Another project currently underway is the changing of a mechanical inter-locking plant at Marshalltown, Iowa, into a fully automatic plant.

AIR TOOLS are used by signal department forces for installing underground lines from insulated joints, with power furnished by track-mounted air compressor.

This will be completed in the early part of 1959. Meanwhile, another similar project is awaiting a decision by the ICC. Since these projects offer an opportunity to make savings in operating expenses, the road is taking a hard look at its other existing interlocking plants to study what changes will produce substantial savings.

With the large crossing-protection construction project mostly behind it, the signal department is now in the process of reducing its forces back to normal. In some locations where conditions are advantageous, a small maintenance gang, highly mechanized, will be used in lieu of section maintainers. The furnishing of Barber-Greene power trenchers and Tractairs, with digging and paving-breaker attachments, to the field forces has increased production per man-hour.

Communications expanded, modernized

Responding to demands for the quick transmission of information, the railroad is enlarging and upgrading its communication facilities.

● Modern communication facilities have become of increasing importance on the North Western. Management must have accurate information quickly to make top-level decisions.

Important information on the location of cars and trains, as well as urgent instructions and other information on costs and programs of current work, are made known to responsible officers by electronic printers and carrier circuits. Yard operation and the dispatch of needful information are speeded up by talk-back, paging and inter-communication systems.

Now has electronics engineer

Since electronics now plays a more important role in communications, the C&NW has recently employed an electronics engineer to keep abreast of the many new applications and technical aspects of this branch of science. The upgrading of existing facilities and the expansion of plant also have made it necessary to expand the work force by adding a new plant inspector and an equipment supervisor.

The on-line force is now made up of 5 chief linemen, 5 equipment maintainers, 63 district linemen and 4 line crews. The latter are construction crews, each of which is comprised of a leader lineman, 3 linemen, and 3 helpers. One more line crew will be added in 1959 because of the repeated line relocations required in connection with the building of new structures for expressways in the Chicago area. To assure having competent employees, the road sponsors an apprentice-training course for its construction linemen, district linemen and equipment installers.

More and more train dispatching is being done today on the North Western by telephone instead of by Morse messages. Also more messages are being transmitted over the telephone instead of by telegraph.

In the last few years, the communications department has been concentrating on the installation of new carrier telephones and circuits and the upgrading of outside plant. The major part of the latter work is the replacement of miles of iron wire with Copperweld wire. Notable work done in 1958 included the installation of 442 miles of telegraph carrier channels, 782 miles of voice-carrier channels and 15 voice repeaters. About 300 miles of iron wire circuits will be changed out in 1959 with copper or Copperweld wire.

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POWER

direct fluid drive

The QUIET crane that will change your thinking about capacities! More smooth power—full 90% efficiency with the ORTON . . .

DIESEL HYDRAULIC LOCOMOTIVE CRANE

Infinite range of speeds and forces! Instant pressure—no drag-down, no jerk, no burn out when heavy torque is applied. Lowest power costs—lowest friction loss. No overload damage—power up, power down.

SAFE! QUIET! SMOOTH! EFFICIENT!

AGAIN, THE MOST POWERFUL NAME IN CRANES

orton CRANE & SHOVEL CO.
608 S. DEARBORN STREET
CHICAGO 5, ILLINOIS

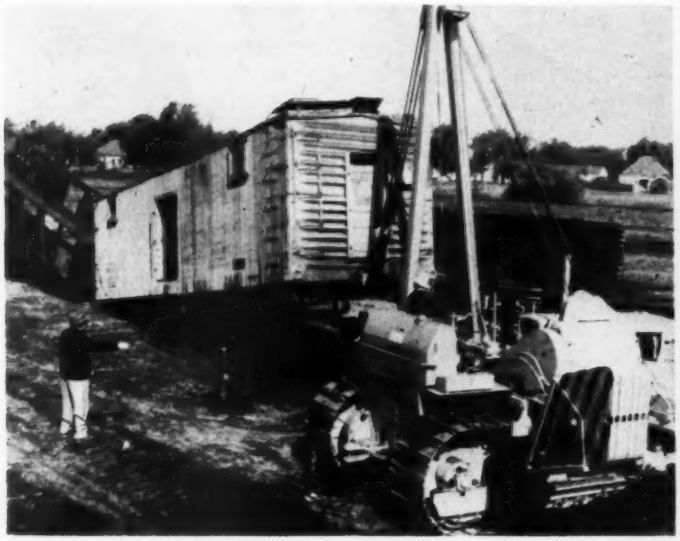
Shaft and shaft-bearings *eliminated!* Open gearing *eliminated!* Clutches *eliminated!* Sources of maintenance . . . *eliminated!* Simple accessible, *hydraulic* components instead of complicated friction-producing mechanical contrivances or electrical components for trouble-free performance *plus* incomparably *smoother, quieter, power!*

FULL POWER EACH TRUCK

CONSTRUCTION has started on a new 17-story general headquarters building for the Atlantic Coast Line at Jacksonville, Fla. Looking like a swanky Florida hotel, the office building will be modern in every respect and should be ready for occupancy in 1960.

SIMULATED DERAILMENT of eight cars was staged by Frisco to permit Caterpillar No. 583 Pipelayer to demonstrate how it could be used in such emergencies. Unit, having a 20-ft boom and a lifting capacity of 65 tons, lifted and pulled cars into clear in 2 hr.

News briefs in pictures . . .



SECOND Rail Grinding Train is announced by the Speno Railroad Ballast Cleaning Co. Like the first, this train consists of 8 specially built grinder cars and an EMD power car. Moving at 2 mph, the train grinds out surface irregularities on both rails simultaneously.

MODEL 441

PETTIBONE SPEED SWING

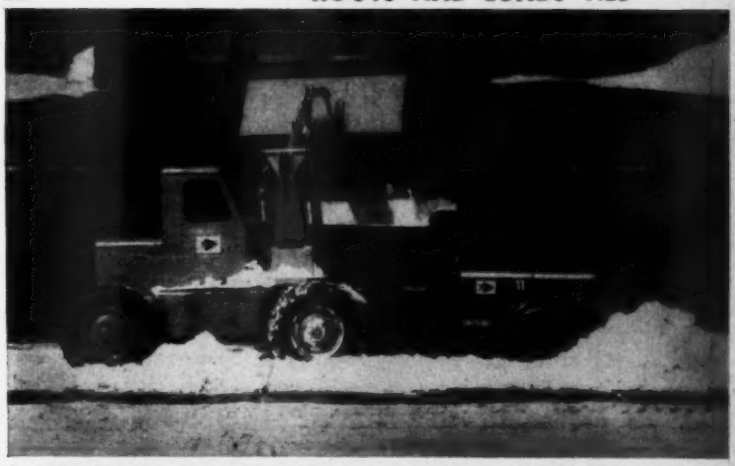
THE MACHINE OF MANY USES

180° SWING LOADER • 4 Wheel Drive • 4 Wheel Steer
BUCKET • TOTE CRANE • FORKS
Off-Track Machine... One-Man Operated

LAYS RAIL • LIFTS TOOLS ON AND OFF TRACK

ROOTS AND LOADS TIES

BUILDS SHOULDERS • STOCK PILES

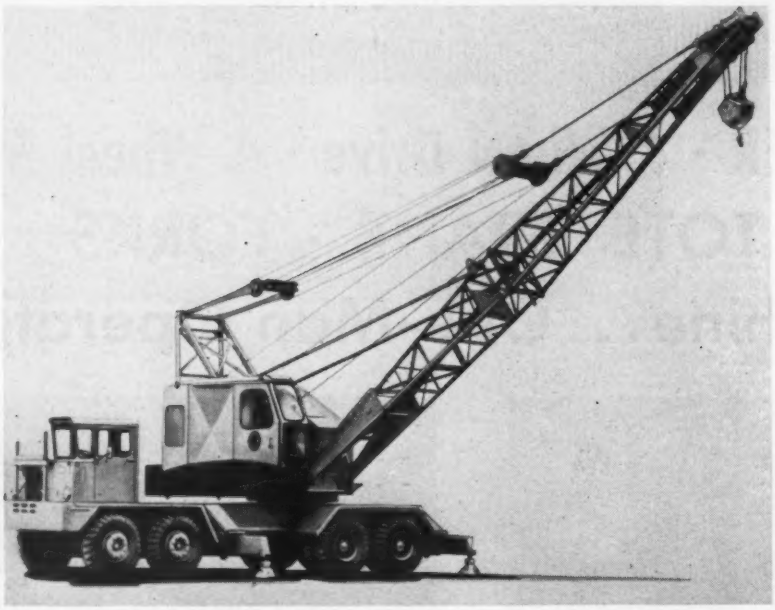


REMOVES SNOW FROM STATIONS, YARDS, TRACKS

PETTIBONE MULLIKEN CORPORATION

4700 WEST DIVISION STREET • CHICAGO 51, ILLINOIS • SPaulding 2-9300 • **BULLETIN No. P165**

Write or Telephone Today for This Bulletin Giving Complete Specifications

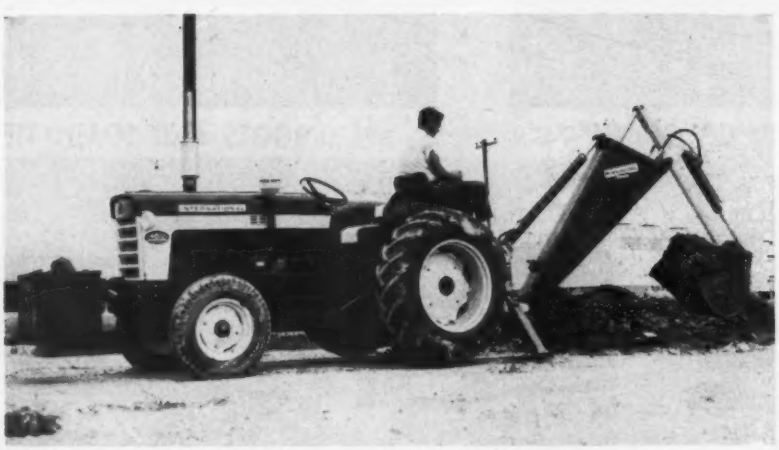


Lift 35 tons with . . .

Large truck crane

SAFE load lifts up to 35 tons with a 40-ft boom, on or off the pavement, is said to be possible with the new model 435 truck crane. This unit has a top travel speed of 26.5 mph. Capable of swinging a 120-ft boom, the 435 can use boom jibs 15, 20, 25, or 30 ft long when extra reach is necessary. Safety boom-limit stops and automatic power-boom lowering are standard equipment. The operator can choose live boom if desired. The combination pin-pad connected boom permits two-man boom-length changes.

Total weight of the truck crane is 89,800 lb. Removal of the counterweight, pedestals, outriggers and boom lowers the weight to 62,500 lb. Powered by a 216-hp engine at 2,400 rpm, the truck has 8 speeds forward. Either gasoline or diesel power units can be furnished for the upper machinery. All four axles are equipped with air brakes. *Koehring Division, Dept. RTS, Milwaukee 16, Wis.*

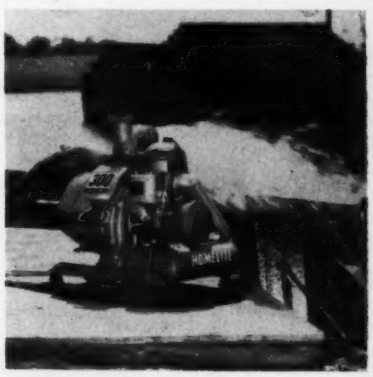


UTILITY tractor No. 460 with International-Pippin backhoe attachment.

Six sizes for . . .

Commercial tractors

A NEW line of wheel tractors is now available in six power sizes for industrial and commercial work. In addition, it is claimed the new line can handle almost any type of equipment used in this work. Estimated horsepower for the new tractors ranges from 12.8 to 72 with four to six-cylinder engines. Engines are available for operating on gasoline, LP gas, distillate, and diesel fuel. Features claimed for the new line include a more powerful hydraulic system, smoothness in operation, freedom from vibration, Tel-a-Depth control of equipment, a visual position indicator for use with traction control, and a Fast-Reverser attachment for quickly changing direction of travel. *International Harvester Company, Dept. RTS, 180 North Michigan Ave., Chicago 1, Ill.*



Many uses for . . .

Centrifugal pumps

DESIGNED for low-cost high-capacity pumping efficiency, three new pumps comprising the Homelite "300" series are now available. Weighing 103 lb each, the new 3-in self-priming centrifugal pumps have a capacity of 18,000 gph and were designed for all-purpose use. The manufacturer states that they are completely new in engine and pump design and that all three models are guaranteed to pump and prime at 28 ft above water level. It is also claimed that the new Model 8 two-cycle engine starts quickly even in the coldest weather, that the pumps' self-cleaning construction permits the handling of muddy and sandy water without clogging and that a manual throttle control allows matching of pumping speeds to job requirements to give the lowest cost operation. It is pointed out that the quiet, slow-speed Model 8S3-1, which has a total head of 65 ft, is ideal for use in city and suburban areas and for emergency night operations where noise would present a problem. The fast-priming, standard-speed Model 8S3-1R has a total head of 125 ft and is used in operations where higher discharge pressures are required, it is stated. The Model 8S3-1P delivers 102 gpm at 60 psi and has a total head of 185 ft. This pump is designed for jobs requiring high discharge pressures, the manufacturer states. *Homelite, Dept. RTS, Port Chester, N. Y.*

The **SONIRAIL** ultrasonic testing unit is specially designed for the detection of web defects in rail, such as bolt hole cracks, head and web or head and base separation, pipes, and the like.

A built-in loudspeaker provides a continuous audible signal that varies in pitch when the search unit passes over portions of rail containing defects. An output meter corroborates the audible signal. On good rail the meter reading will be stable at about mid-scale. On other than good rail the meter reading is reduced.

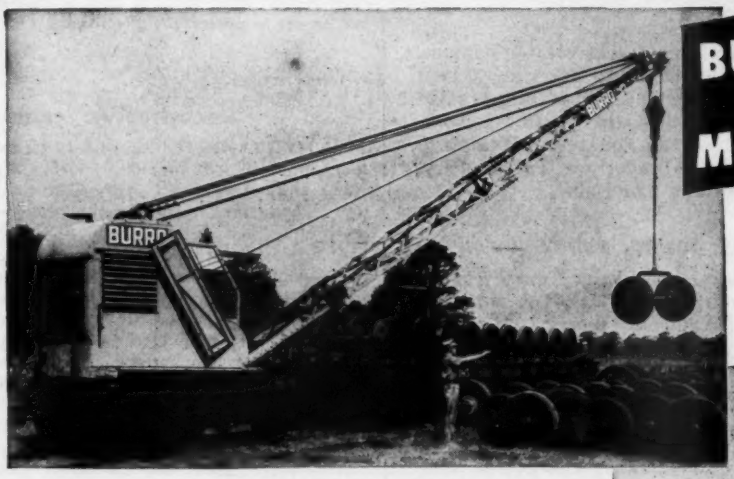
The meter reading is far more sensitive than the loudspeaker to variations in rail conditions, and definitely attracts the operator's attention. An experienced operator can readily interpret changes in the audible signal to determine the extent of the defect.

PRICE
(F.o.b. Franklin Park, Illinois)

SONIRAIL	$495.00
Carrying Case	45.00
Self-oiler	25.00

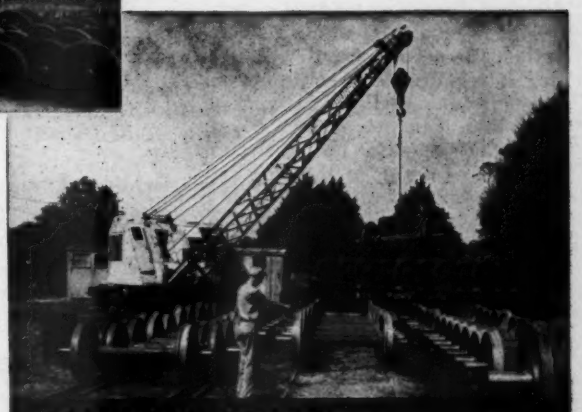
TELEWELD INC

11535 FRANKLIN AVENUE, FRANKLIN PARK, ILLINOIS



BURRO WORK POWER *means...* MORE EARNING POWER

Unloading car wheels with a Burro. The Burro moved the flat car into position and will haul it away when wheels are unloaded.



This job—handling wheel assemblies in and out of storage—won't support high costs. That's why a Burro is doing the job.

***Any* job—on the line, in the yards, or Stores Department—can be done profitably with a Burro because Burros are fast, efficient workers with hook, magnet, tongs, bucket or dragline. Fast travel speeds and heavy draw bar pull enable the Burro to go to the job in a hurry—and even haul its own cars with it!**

Write for Bulletins and more information about Burro cranes. There is no obligation.

Represented In Canada by:
Sylvester Steel Products Co., Ltd., Lindsay, Ontario

CULLEN-FRIESTEDT CO.,
1301 S. KILBOURN AVE. CHICAGO, ILLINOIS

L-W Tournatractor® speeds dozing, pulling, pushing tasks anywhere. Rubber-tired mobility lets you drive on highways or right-of-way; handle work on, off, or across tracks. You eliminate work-train service, mainline delays, because operator simply gets on and drives to next assignment at a moment's notice. This speeds service, saves time.

Stays clear of traffic

Because 17.2 mph L-W Tournatractor gets out of the way fast, it does not tie up rail traffic while cleaning drainage ditches or landslides, cutting down banks, spreading cinders, ballast, preparing grade crossings, etc. It requires no work train, no train crew, no loading and unloading delays. Operator simply drives out to the job, cleans up the dirt to be moved, goes on to the next assignment immediately.

Your regular maintenance-of-way crew can become competent operators in a short time. All work functions are handled by electric motors.

Will not damage system

Big rubber tires of L-W Tournatractor roll over tracks without damage. You don't have to worry about bent rails, chamfered ties, inoperative switches where this machine is working. Nor do you need planking to drive this tractor over soft, slippery, or shifting materials.

Tows, pushes, switches

Besides doing heavy-duty dozing on your right-of-way, Tournatractor can aid other machinery—it tows and operates other wheeled work units, push-loads self-propelled scrapers. If you choose L-W's coupler-equipped model, called SwitchTractor†, for your work, it can also provide off-track emergency car switching service as desired.

Get complete information

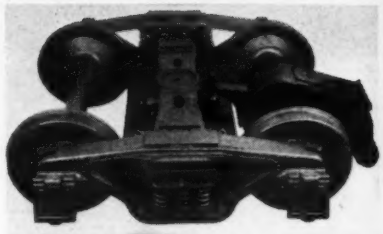
Before you buy any tractor, it will pay you to get all the facts from LeTourneau-Westinghouse on high-speed, rubber-tired Tournatractor.

† Trademark CT-1891-RR-2/3

LETOURNEAU-WESTINGHOUSE COMPANY
Railroad Sales Division
Peoria, Illinois
A Subsidiary of Westinghouse Air Brake Company
Where quality is a habit

MEMBER

Products (cont'd)



New Hydra Orton drive is said to deliver full power to each truck at all times.

No open gearing on . . .

Locomotive crane

THE HYDRA ORTON is said to be the first completely hydraulic diesel locomotive crane. All open gearing, shafts, shaft bearings and clutches are eliminated on the new machines which, it is claimed, does way with all major sources of maintenance. The crane, which is available in 8 sizes ranging from 15 to 60 tons capacity, is claimed to operate smoothly and quietly at 90 per cent efficiency. The manufacturer states that the basic hydraulic principle substitutes relatively simple contrivances for more complicated mechanical or electrical devices, holding power costs and friction losses to a minimum and eliminating overload damage. *Orton Crane & Shovel Co., Dept. RTS, 608 South Dearborn St., Chicago 5, Ill.*

Versatility claimed for . . .

Herbicide

ATRAZINE 50W herbicide is now available for non-selective or industrial weed control on non-cropped land. The new Geigy product is a triazine compound that is a 50 per cent wettable powder which is designed to act mainly through the roots of weeds. It is claimed to control annual broadleaf weeds and grasses and many

"That's the big boss!...I bet the railroad budgets CHIPMAN weed and brush killers now!"

Chipman chemicals and application service are backed by over 45 years of railroad weed control experience. A broad line of weed, grass and brush killers is available. Each chemical or chemical combination is formulated for specific vegetation problems. Most widely used are these trade-name products:

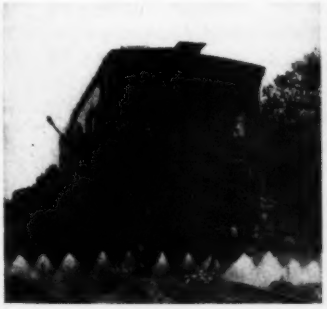
Atlacide • Atlas "A" • Chlorax • Chlorea • Methoxone-Chlorax
TCA-Chlorax • Methoxone-Chlorea • Chipman Brush Killer

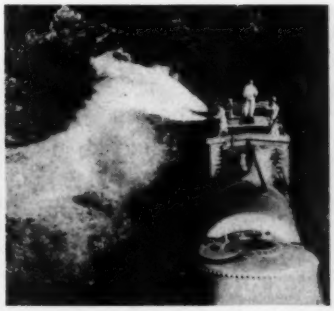
We can solve *your* weed problems with the *right* chemicals and application service. Check with us today!

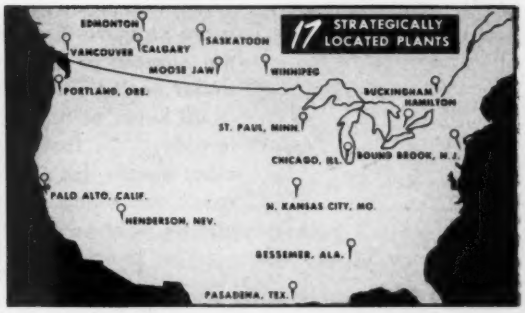
CHIPMAN
Chemical Company, Inc.

World Leader in Chemical Weed Control Since 1912

RAILROAD DIVISION HEADQUARTERS
608 South Dearborn St., Chicago 5, Ill.







on the 1959 equipment recommendation lists of the vast majority of roads using power tampers. The reason is simple: Judged from any angle, versatility, economy, efficiency, or dependability, the JACKSON MAINTAINER is decidedly superior . . . more than ever for '59 with its much more powerful tamping motors which speed up penetration and decrease the number of insertions required. It gives you maximum consolidation under each tie and right under the rail, the vital load-bearing zone . . . in all kinds of ballast materials . . . in all lifts of track, in all production tamping . . . faster and better spot tamping than can be done by any other means. Let us give you the facts which so plainly indicate why most roads are using JACKSON MAINTAINERS, and lots of them. Why not phone, right now, for any information desired.

Acquirement plans to suit your needs.

JACKSON VIBRATORS, INC.
LUDINGTON, MICHIGAN

perennial weeds and to be effective from late spring through early summer. Also that it may be applied not only before weeds emerge but also within several weeks following their emergence. The manufacturer states that when Atrazine 50W is used with its Simazine 50W herbicide a complete year-round program for industrial weed control is available. The new product is claimed to be low in toxicity to man and animals and does not require the use of special protective clothing. Also that it is non-flammable, low in electrical conductivity, non-corrosive and is easily flushed from the sprayer equipment with water. *Geigy Agricultural Chemicals, Division of Geigy Chemical Corporation, Dept. RTS, Saw Mill Road, Ardsley, N. Y.*

A question . . . . . and an answer

Looking for the "What's the Answer?" department? It'll be back next month. It was omitted from this issue to allow more space for the special report on the C&NW. Questions to be answered in February and March were published in earlier issues. Given below are the qustions to be answered in the April issue.

Answers are solicited from readers. They should be addressed to the "What's the Answer" editor, Railway Track and Structures, 79 W. Monroe St., Chicago 3, and reach him at least six (6) weeks in advance of the publication date (the first of the month) of the issue in which they are to appear. An honorarium will be given for each published answer on the basis of its substance and length. Answers will appear with or without the name and title of the author, as may be requested. The editor will also welcome any questions which you wish discussed.

To be answered in the April issue

1. What operation in a rail-laying gang is in the greatest need of mechanization? What other rail-laying operations need mechanizing? Explain.

2. When using paint-spray equipment while painting bridges, how are the surfaces in corner pockets coated properly? Explain procedure.

3. What is the most economical method for renewing cemented ballast on concrete-slab trestles when other repairs are not required? Explain in detail.

4. What factors determine when rip rap shall be side-dumped or thrown loose and when it shall be hand-placed, or hand-placed and grouted? Explain.

5. How many ties should be used under insulated joints? How should they be spaced? Is it advisable to use longer ties than the standard crossties under these joints? Explain.

Binks air-operated pumps, 500 ft. away, supply thixotropic aluminum pigmented coatings to painting stages. There are no paint pots on the stages to refill or create a hazard.

AT BOONE, IOWA...

Binks pumps help C&NW RR cut viaduct painting time 60%

"We pumped coatings direct to the spray guns instead of lowering paint pots to the stages," reports Mr. B. R. Meyers, chief engineer for the Chicago & Northwestern Railroad. "This saved both handling time and materials. Thixotropic materials in drums were brought in by derrick car and spotted along the one-half mile long viaduct. After agitation, the coatings were pumped to a supply drum. From there a Binks 8 to 1 heavy-duty pump took over. Operation was continuous."

Binks spray guns cut material cost

The spray guns used low-pressure internal-mix nozzles. This reduced overspray and saved coating material. High-pressure internal-mix nozzles were used in high wind areas to make sure the coating went on the steel.

Send for Bulletin 704

Learn how Binks material handling pumps can save you time and money. Ask your nearest Binks Branch Office or Railroad Representative for a copy. If you prefer, write direct to the address below.

Ask about our spray painting school
Open to all...NO TUITION...covers all phases.

9059

Binks
EVERYTHING FOR
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SPRAY GUNS

AIR COMPRESSORS

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REPRESENTATIVES IN PRINCIPAL U.S. & CANADIAN CITIES • SEE YOUR CLASSIFIED DIRECTORY

Assembly retracts and locks under vehicle, with adequate clearance for highway travel.

Maintenance-of-Way Personnel Can Cover Track Quickly...at Low Cost with the Versatile

Rail-Road CONVERSION UNIT

TRAVELS OVER RAIL OR ROAD

For more and more of America's railroads, the **Rail-Road** is saving time and money. Mounted on automobile or light truck for fast travel on track or highway, it is ideal for inspection trips or for hauling men, materials and tools right to the job.

Pictured is a **Rail-Road** Conversion Unit installed on a new International Travelall. The complete vehicle, ready to roll, is available for prompt delivery—or any new automobile or light truck of your choice, with **Rail-Road** Conversion Unit installed.

The **Rail-Road** is available also as a "kit" for installation on your equipment in your shops . . . or installed on your vehicle in our shops. It can be installed easily on almost any make of sedan, station wagon, pickup, panel or light truck.

Simple manual operation is foolproof and maintenance-free. It takes **one man less than a minute** for on-track positioning or removing from track to clear traffic.

The low initial cost of the **Rail-Road** spreads over years of service.

Write or telephone for full information . . .
or for a no-obligation **Demonstration** on your line.

W. T. Cox Company

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C&NW
FORMULA FOR EFFICIENCY

Coping with snow and ice problems

The C&NW operates through territory where ice and snow are a problem in winter, with snow drifts often reaching to the tops of trains. Since the number of storms and amounts of of snow vary widely from season to season, this is one of the most difficult items for a roadmaster to estimate for his functional budget.

Various machines and devices are used by the road to reduce the amount of hand labor required for snow fighting. All divisions are equipped with wedge plows. In addition to these and the conventional flangers, Jordan spreader-ditchers are used for bucking drifts and cleaning out cuts. Occasionally, when one division has a more severe storm than another, these machines are sent from one division to another.

The road also makes good use of its many Tractairs in winter. Using blow pipes, snow is blown away from switches to greatly reduce the need for sweeping and hand shoveling. Large use, particularly at outlying turnouts, also is made of pot-type oil-burning switch heaters for melting snow at switches and at scissors crossings. In the terminals and at many interlocking plants, the White switch heaters, burning either propane or natural gas, are used. Because of the less man power required for servicing the gas switch heaters, the road is installing more of this type. At one location in Chicago, the road has a Racor intermittent-blast snow blower for keeping a double-slip switch clear of snow. It is turned on and off from a tower by remote control.

A limited number of mechanical brooms are provided for sweeping snow from platforms. Rubber-tired tractors, equipped either with front-end loaders or snow plows, are also brought into action when required for opening roads to team tracks and for loading snow into cars or trucks in restricted areas.

When storms are severe, the road usually hires extra help to give its regular forces rest and to avoid overtime payments. At some locations, the road contracts with local firms to keep platforms and driveways cleared of snow.

P-S APPOINTS NEW TRACK EQUIPMENT REPRESENTATIVES

...puts skilled maintenance-of-way counsel in your area

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The appointment of these representatives—located in important rail centers—is the latest step by Pullman-Standard toward providing even better service to America's railroads. The staffs of these skilled, knowledgeable organizations stand ready at any time to meet with you to discuss the advantages of the complete line of Pullman-Standard Track Equipment: the P-S Power Tie Spacer, P-S Power Cribber, P-S Power Ballaster and the P-S Cleaner and Winch Car Team.

Whatever your requirements—spare parts, equipment service or a complete discussion of the Pullman-Standard Track Equipment Purchase or Lease Plans—contact the representative in your area or the office listed below.

TRACK EQUIPMENT DEPARTMENT

PULLMAN-STANDARD

CAR MANUFACTURING COMPANY

Subsidiary of Pullman Incorporated

1414 Field Street, Hammond, Indiana • In Canada, The Holden Company, Ltd., Montreal, Quebec

Biographical briefs (cont'd)

(Continued from page 10)

gineer's office at Toronto, later advancing to assistant bridge engineer. In 1956 he was promoted to bridge engineer of the Atlantic Region at Moncton, N. B. He became assistant to chief engineer of the Grand Trunk Western at Detroit in January 1958, the position he held at the time of his recent promotion.

Anthony P. Buono, 46, who was recently promoted to track supervisor on the Erie at East Buffalo, N. Y. (*RT&S,* Nov., p. 10), was born at Hornell, N. Y. and attended schools there. He entered the service of the Erie in 1928 as a trackman at Hornell. In 1933 he became assistant foreman there and five years later was appointed extra gang foreman at the same location. He served as section foreman and general foreman at Hornell, Corning and Buffalo, N. Y., before his recent promotion to track supervisor.

Charles E. Pitzer, 42, was recently promoted to supervisor track on the Pennsylvania—Reading Seashore Lines at Woodbury, N. J. (*RT&S,* Nov., p. 10), was born at Hanover, Pa., and attended schools there. He entered the service of the Pennsylvania in 1950 and five years later became general foreman track. In 1957, he was appointed assistant supervisor track there, which position he held until his recent promotion to supervisor track.

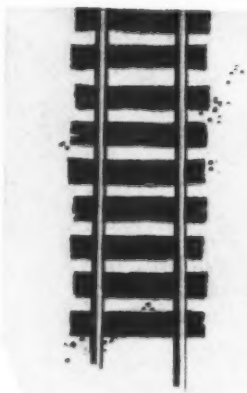
Harry Gessner, 28, who was recently promoted to supervisor track on the Pennsylvania at Dunkirk, N. Y. (*RT&S,* Nov., p. 10), was born at Philadelphia and graduated from the Drexel Institute of Technology in 1953. He entered service of the Pennsylvania in 1953 as a draftsman in the chief engineer's office at Philadelphia. In 1954, he was appointed junior engineer, serving in that capacity at Camden, N. J., and Baltimore, Md. In January 1955 he was appointed assistant supervisor track at Aspinwall, Pa. He was later transferred to Steubenville, Ohio, where he was serving at the time of his recent promotion.

Winfield B. Knight, 40, who was recently promoted to district engineer on the Penn-Sylvania at Harrington, Del. (*RT&S,* Nov., p. 10), was born at Taunton, Mass., and graduated from Northeastern University in 1941 with a Bachelor of Science degree in civil engineering. He entered the service of the Pennsylvania in July 1941 as an engineer apprentice at Jersey City, N. J. The following month he entered military service in the U.S. Army, serving in the Pacific theatre of operations. In February 1946 he returned to the Pennsylvania as engineer apprentice, being appointed assistant supervisor track at Niles, Ohio, a year later. Subsequently he served in the same capacity at Philadelphia. Mr. Knight was promoted to supervisor track at Alliance, Ohio, in 1950 and later held the same position at Terre Haute, Ind., and Dennison, Ohio. In February 1955 he was promoted to assistant division engineer at Baltimore, Md., and nine months later he was advanced to assistant district engineer there, the position he held at the time of his recent promotion to district engineer.

Arthur T. Powell, 65, who recently retired as assistant chief engineer of the Grand Trunk Western at Detroit, Mich. (*RT&S,* Nov., p. 10), was born at Athens, Ohio, and received his higher education at the University of Kansas. He entered railroad service in 1914 on the Elgin, Joliet & Eastern as a chainman, later advancing to rodman and instrumentman. In 1916 he joined the Grand Trunk Western as a draftsman, being appointed assistant engineer in 1920. Mr. Powell was appointed engineering accountant the following year and became office engineer in 1944. He was promoted to assistant chief engineer in 1947, which position he held until his recent retirement.

W. B. Knight
PRR

A. T. Powell
GTW



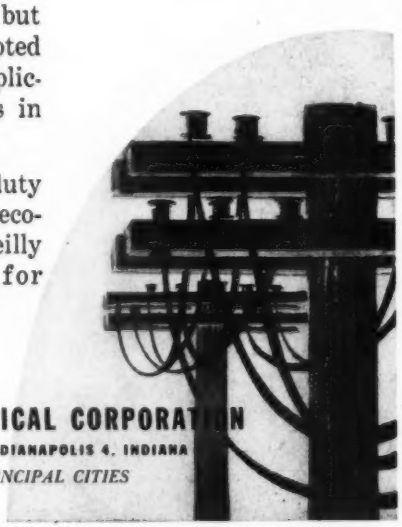
Telephone poles, cross ties, bridges and other wooden engineering structures treated with Reilly Creosote Oil are still in use after 50 years, because they have been guarded in service by Reilly Armed Creosote.

Guard Duty for 50 years!

REILLY CREOSOTE OIL

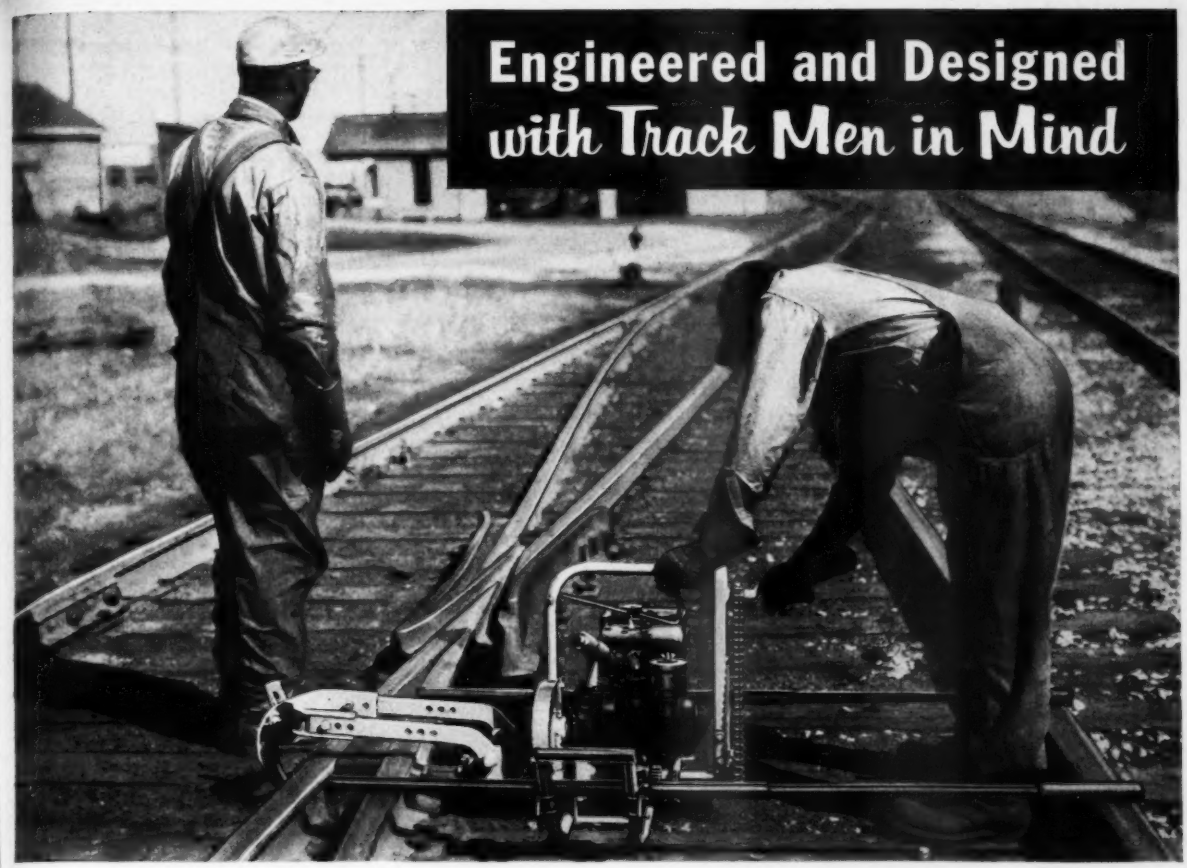
Reilly Creosote Oil is composed of more than 162 chemical compounds, many of which singly are toxic to fungi, mold, termites and marine borers. These pests may (and often do) adapt themselves to resist a single toxic agent, but none has ever adapted himself to the multiplicity of toxic agents in Reilly Creosote Oil.

There is no guard duty so effective, and so economical. Specify Reilly Armed Creosote for wood preservation.



ARMED
Creosote

REILLY TAR & CHEMICAL CORPORATION
MERCHANTS BANK BUILDING, INDIANAPOLIS 4, INDIANA
SALES OFFICES IN PRINCIPAL CITIES



Engineered and Designed with Track Men in Mind

WESTERN FORMERLY BUDA Power Track Drill

Here is a vital piece of equipment in keeping track modernization, expansion and maintenance programs in high gear—the Model P power track drill that has ALL the features essential to economical operation.

EASILY SET UP...and ACCURATE. Can be located from top of rail (with optional telescopic support and locater rods) or positioned on ties and ballast (with long overclutch and adjustable rail guide). No change in set up necessary while working on same size rail.

COMPACT and PORTABLE. Weighs only 130 pounds. Can be started, operated and slid along the rail *by one man.* Easily carried overland by two men.

DEPENDABLE. Gives all-weather, long-life service. Powered by easy-starting 1¾ h.p., 4-cycle Briggs & Stratton air-cooled gas engine. Equipped with Timken roller thrust bearing. Versatile spindle sleeve handles all flat drills from 7/16" to 1 9/16".

SAFE. Can be released and removed from track within 10 seconds . . . no stopping and backing off.

CONTROLLED FEED. Avoids broken and prematurely dulled drills. Sensitive crank-chain mechanism allows operator to vary the thrust accurately according to the hardness of the rail and sharpness of the drill.

FAST. Drills 1⅛" hole in 90 lb. rail in 30 seconds . . . in 155 lb. rail in less than 90 seconds.

HYDUTY-PAULUS MANUAL TRACK DRILL

A track maintainer's tool that every section house should have. Special safety and adjustment features assure precision drilling plus instant emergency detachment.

6803

Write for Detailed Information

WESTERN RAILROAD SUPPLY COMPANY

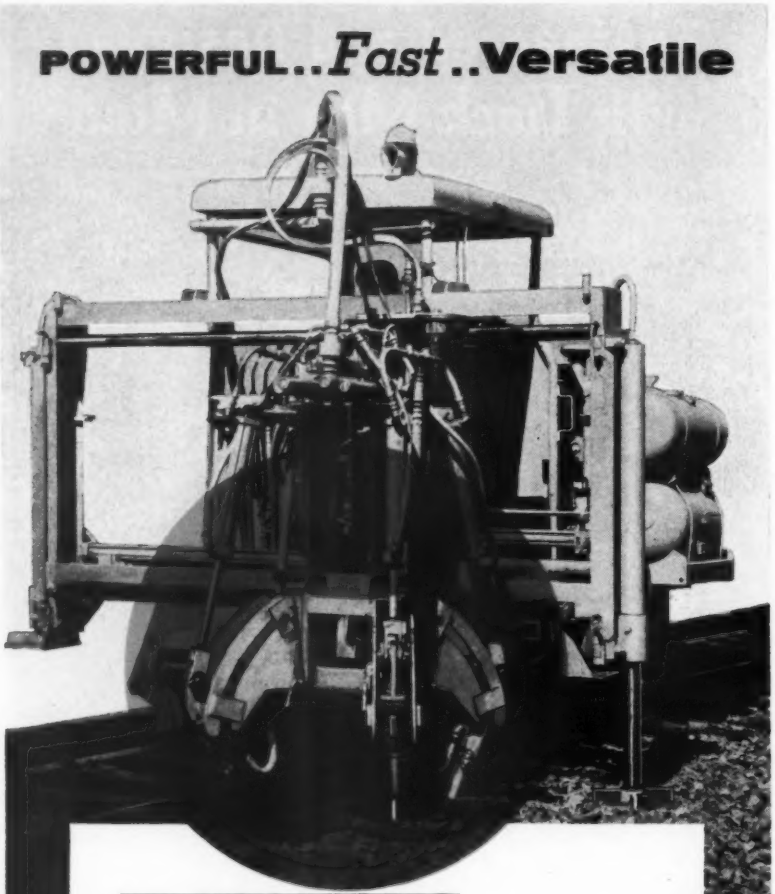
Division of Western Industries, Inc.

2742 West 36th Place, Chicago 32, Illinois

IN CANADA: Melville Machinery Co., Ltd., 515 Bisson Street, Montreal 3, Quebec

One of a series of ads featuring new WESTERN products formerly supplied by BUDA

POWERFUL..*Fast*..Versatile



McWILLIAMS
SPOT TAMPER

With hydraulic jacks and air tamping, it provides ballast compaction equivalent to the McWilliams Multiple Tie Tamper. Travel speeds up to 25 mph, and means for setting off quickly. *Write for Bulletin ST-200.*

SPOT SURFACING . . .
Will correct cross level and pick up low joints on both rails with traversing head.

YARD and TERMINAL MAINTENANCE . . .
Tamps 85% of turnouts and has provisions for spiking guns, nutting attachments and other air tools.

WITH TIE GANGS . . .
Completely tamps all new ties a gang can install in a day.

WITH RAIL GANGS . . .
Will tamp all loose ties, keeping up with the gang.

ONE MAN OPERATION

Railway Maintenance Corporation

PITTSBURGH 30, PA.

Biographical briefs (cont'd)

George M. Cornell, 53, who was recently appointed chief engineer of the Virginian at Norfolk, Va. (*RT&S*, Oct. p. 10), was born at Chicago and graduated from the University of Minnesota in 1925 with a Bachelor of Science degree in civil engineering. In 1928 he received a Master of Science degree in transportation engineering from Yale University. He entered railroad service with the Soo Line in 1925 as a draftsman in the bridge department. In December of that year he joined the Northern Pacific in the same capacity at St. Paul, Minn., remaining there until he entered Yale University in 1927. Mr. Cornell went with the Chesapeake & Ohio in 1929 where he served as rodman before being promoted to assistant engineer with the superintendent of bridges and buildings at Richmond in 1930. In 1932 he began working with the cost engineer there on studies of the economics of maintenance-of-way department production. Four years later he was transferred to the office of the general superintendent at Huntington as transportation inspector. From October 1941 to December 1944 he served with the Transportation Equipment Division of the War Production Board in Washington, D. C., as principal technical consultant, deputy director and director. Mr. Cornell has been with the Virginian since January 1945 as assistant to the president and has been in charge of labor relations.

Lawrence A. Gillett, 61, who recently retired as chief engineer of the Virginian (*RT&S*, Oct., p. 10), was born at Newburyport, Mass., and graduated from Massachusetts Institute of Technology and Harvard University with Bachelor of Science degrees. He entered railroad service with the Florida East Coast in 1923 at St. Augustine, Fla., after working with contractors in Massachusetts and New Jersey. In 1924 he was appointed engineer of structures there. Mr. Gillett joined the Cincinnati Union Terminal in 1928 in the same capacity, serving until 1934 when he became district director of the Works Progress Administration. In 1942 he became regional director for the Federal Works Agency in Chicago and later in New York City. Mr. Gillett returned to railroading in 1946 as assistant chief engineer of the Virginian at Norfolk, Va. He was promoted to chief engineer the following year, which position he held until his recent retirement.

George M. Cornell
Virginian

Lawrence A. Gillett
Virginian

John T. Hiner, 37, who was recently appointed chief engineer, maintenance of way and structures, on the Southern at Cincinnati, Ohio (*RT&S*, Sept., p. 10), was born at Marlinton, W. Va., and graduated from the Virginia Military Institute in 1943. He entered the service of the Southern in 1942 as a section laborer at Charlottesville, Va. After graduation he was appointed rodman at Charlotte, N. C., and was later advanced to transitman there. He was appointed student apprentice at Charlottesville and further advanced to assistant track supervisor at the same location. From May 1943 to August 1946 he was in the service of the U. S. Army in the transportation Corps serving in Europe with the 733rd Railway Operating Battalion. After the war Mr. Hiner served as track supervisor and bridge and building supervisor at various locations before being promoted to assistant division engineer at Atlanta, Ga. In 1955 he was appointed division engineer at Bristol, Va., and was transferred to Greenville, S. C., the following year. He was serving as assistant chief engineer at Cincinnati at the time of his recent promotion.

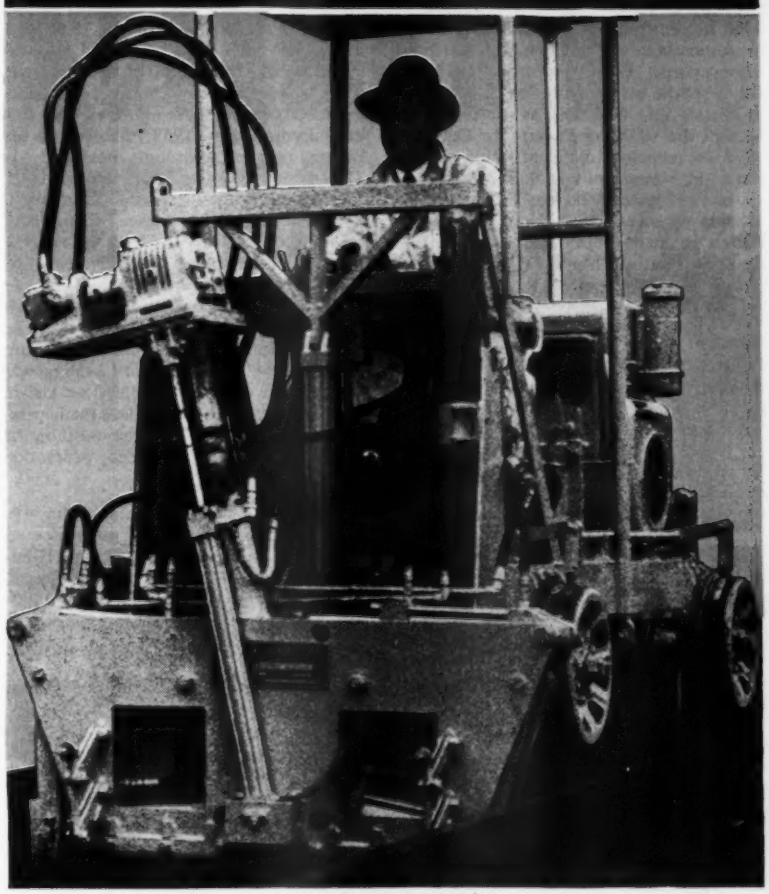
John L. Jensen, who was recently promoted to chief engineer of the Minnesota Transfer-St. Paul Union Depot at St. Paul, Minn. (*RT&S*, Sept. p. 10), is a native of Letcher, S.D. He was graduated from the University of Minnesota in 1945 with a bachelor's degree in civil engineering and received a degree in electrical engineering from the International Correspondence Schools in 1949. He entered railroad service with the St. Paul Union Depot in September 1947 and was appointed assistant engineer of both companies in 1950. In 1954 he was promoted to assistant chief engineer of both companies, the position he was holding at the time of his recent promotion.

Norman F. Podas, 70, who recently retired as chief engineer of the Minnesota Transfer-St. Paul Union Depot, at St. Paul, Minn. (*RT&S*, Sept, p. 10), was born at Cokato, Minn. He entered railroad service with the Milwaukee in 1905, working as a roundhouse helper and locomotive fireman. He began his engineering career with the Milwaukee in 1907 as a chainman on new line construction in the Cascade Mountains in Washington. In 1908 he was transferred to Seattle as instrumentman on construction of car ferry terminals. After completion of this job he worked on various railway location jobs for the Milwaukee until January 1910. He then left the Milwaukee and

John L. Jensen
Minnesota Transfer

John T. Hiner
Southern

Lines 1000 to 2000 Feet of Track per Hour!



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WHEEL-MOUNTED LINE Master

Using only an operator and one man for sighting, LineMaster provides outstanding maintenance economies. With lining head anchored to roadbed by a power-driven spud inserted in the crib, hydraulic cylinders under precise control of the operator move track in either direction. Available in wheel-mounted and crawler-mounted types.

Railway Maintenance Corporation

BOX 1888, PITTSBURGH 30, PA.

Biographical briefs (cont'd)

joined the Oregon Washington Railroad & Navigation Co. (now part of the UP) as instrumentman on location and construction at Cosmonolis, Wash. In March 1912 he returned to the Milwaukee as an instrumentman on maintenance work at Minneapolis. From February 1918 to July 1919 he served with the U. S. Army in France and Germany as master engineer of the 602nd engineers. In October 1919 he returned to the Milwaukee and served at Minneapolis in the positions of assistant engineer, resident engineer and division engineer before being appointed district engineer of the Minnesota Transfer at St. Paul. In May 1939 he was promoted to chief engineer, the position he held at the time of his recent retirement.

Archer P. Crosley, who recently retired as engineer maintenance of way of the Reading at Philadelphia, Pa. (*RT&S,* Oct. p. 10), is a native of Merchantville, N. J., and a graduate of Cornell University. He began his railroad career with the Reading in 1917 as a rodman. In 1952 he was promoted to assistant engineer, maintenance of way after serving as division engineer at Harrisburg, Pa., Tamaqua and Philadelphia. In 1954, he was appointed engineer maintenance of way, the position he was holding at the time of his recent retirement.

David T. Faries, 46, who was recently named chief engineer of the Bessemer & Lake Erie at Greenville, Pa. (*RT&S,* Aug., p. 10), obtained his B.S. degree in civil engineering from Virginia Military Institute in 1935. He entered railroad service with the Wabash in June 1935 as a draftsman. He served as third assistant engineer on the Wabash from March 1936 until July 1937 when he was named assistant engineer of the Ann Arbor. In January 1938 he was promoted to second assistant engineer on the Wabash, serving in that capacity until June 1939 when he was appointed grade separation engineer. In December 1939, he was named roadmaster on the Ann Arbor. On January 1, 1942, he entered the service of the B&LE as assistant supervisor of track. He served in that capacity until November 1943 when he was promoted to supervisor of track. In December 1948 he was promoted to assistant engineer which position he held until June 1955 when he was appointed engineer of track. In April 1956 he was appointed assistant superintendent and in May of the following year was made principal assistant engineer, the position he held at the time of his recent promotion to chief engineer.

Fred E. Huddleston, Jr., 45, who was recently appointed general supervisor of track on the Chesapeake & Ohio at Huntington, W. Va. (*RT&S,* Aug., p. 10), began railroad service with the C&O in August 1931 as an assistant lineman. He held the position of laborer from July 1932 until 1937 when he was named relief track foreman. In 1941 he was promoted to signal helper. After serving with the U.S. Army from 1942 to 1946, he returned to the C&O as a foreman, serving in that capacity until 1955 when he was named assistant cost engineer. In 1956 he was appointed supervisor of track in charge of system rail forces, the position he held at the time of his recent promotion to general supervisor of track.

Robert F. Lawson, 40, who was recently named district engineer of the New York Central at Cleveland, Ohio (*RT&S,* Aug., p. 10), graduated from Ohio State University in 1940 with a B.S. degree in civil engineering. He entered railroad service with the NYC in December 1940 as assistant engineer at Springfield, Ohio, later serving in that capacity at Mattoon, Ill., and Indianapolis, Ind. He was promoted to assistant bridge and building supervisor in January 1946 at Galion, Ohio, and in September of the following year he was named office engineer at Springfield. In July 1952 he was appointed assistant division engineer at that location. He was promoted to division engineer in April 1955 at Mattoon, and was transferred the following January to Chicago. In March 1957 he was named district methods engineer at Indianapolis and in October 1957 was appointed assistant district engineer at Cleveland — the position he held at the time of his recent promotion.

Gangs of men are not needed to keep switches open when WHITE Gas Burning Switch Heaters are used. For 25 years they have proven to be the only snow melters which can effectively cope with maximum storms. There are no clogged switches with WHITE heaters. Also available with WHITE remote controls.

Write for descriptive circulars.

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GAUTIER
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Here is one of the heaviest, and most rugged, rail anchors on the market. It is made from alloy spring steel . . .

it is tough, durable, and sure-gripping with plenty of take-up so that it can be used again and again . . .

it is applied with a maul or spike maul and it can't be overdriven. For Strength, Durability, and Economy . . .

specify and insist on the Improved Gautier Rail Anchor

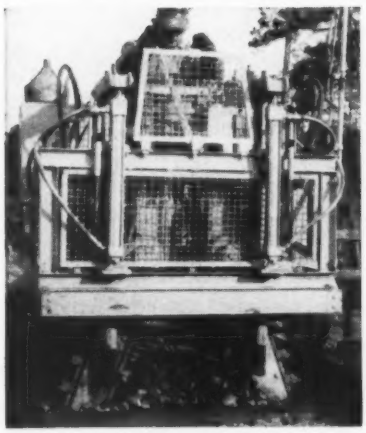
MID-WEST FORGING & MANUFACTURING COMPANY

Distributors: D. V. MAHER, Cleveland, Ohio; WILLIAM ALLEN, Denver, Colorado; JOHN O'BRIEN, St. Paul, Minnesota; W. T. RICHARDS, San Francisco, California; G. C. HUNT & CO., Atlanta, Georgia

Dependable Aeroquip Hose Lines Selected for Maintenance Equipment

Seaboard Air Line Railroad Mechanizes the Gandy Dancer

Aeroquip Hose Lines have the rugged dependability needed for long service on hydraulic maintenance equipment. And when replacement lines are needed, Aeroquip Hose and Reusable Fittings are field assembled quickly, right on the job. Downtime is held to a minimum and replacement costs are reduced.



Seaboard Air Line developed this mechanical ballast remover. Aeroquip Hose Lines on front hydraulic cylinders withstand vibration, flexing and abrasion.

Ties are cut and spikes pulled hydraulically by this portable machine. Aeroquip High Pressure Hydraulic Hose Lines give long, trouble-free service for Seaboard.

This bed scarifier is another of Seaboard's mechanized units with dependable Aeroquip Hose Lines. Tie pullers, ballast tampers and power jacks also use Aeroquip Hose Lines.

Seaboard Air Line Railraod maintenance men designed these set-offs for easy handling of maintenance equipment removed from the tracks.

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AEROQUIP (CANADA) LTD., TORONTO 19, ONTARIO

AEROQUIP PRODUCTS ARE FULLY PROTECTED BY PATENTS IN U.S.A. AND ABROAD

Biographical briefs (cont'd)

O. P. Nicely, 45, who was recently promoted to supervisor bridges and buildings of the Chesapeake & Ohio at Clifton Forge, Va. (*RT&S*, Nov., p. 10), was born in Allegheny county, Va., and attended schools there. He entered the service of the Chesapeake & Ohio in 1933 as a laborer. In 1938 he became a carpenter helper on the Clifton Forge division, later advancing to second grade carpenter and then to first grade carpenter. In 1949 he was appointed assistant supervisor bridges and buildings on the Clifton Forge division, the position which he held at the time of his recent promotion.

Association News

Maintenance of Way Club of Chicago

The next meeting of the club will be held on January 26 in the Grand Ballroom of the Hamilton Hotel, Chicago, with dinner being served at 6:30. Highlight of the meeting will be an address by Ray McBrian, director of research, Denver & Rio Grande Western, entitled "Atomic Energy in Railroads." Both slides and moving pictures will be shown to illustrate the address.

Northwest Maintenance of Way Club

At the next meeting of the club, to be held on January 22, a moving picture will be shown entitled, "Petrified River." It was produced by the Union Carbide Corporation and shows the mining of uranium and the application of atomic power. A short railroad subject, to be announced at a later date, will be presented at the meeting. As usual, the meeting will be held at the Midway Civic Club, 1931 University avenue, St. Paul, Minn.

Association of Track and Structure Suppliers

Early in January, the association will issue space application forms and floor plans for the exhibition to be held at the Coliseum in Chicago, September 14-17, 1959, according to Lewis Thomas, executive secretary. The exhibition will be held at the time of the concurrent conventions of the Roadmasters' and Maintenance of Way Association and the American Railway Bridge & Building Association. Mr. Thomas also announces that inquiries already received from prospective exhibitors indicate that the exhibit will equal in size the last very successful show held in September 1956. Those interested should address the Director of Exhibits, Association of Track and Structure Suppliers, Room 705, 59 E. Van Buren street, Chicago 5.

WEED CONTROL by UROX®

Sensational Granular Herbicide Gives Longer-Lasting Control... *at Lower Cost!*

Railroads all over the country are finding they can control weeds and brush faster, easier, for a longer time and at lower cost with General Chemical's UROX Weed Killer.

Long-term control! Even in areas of heavy rainfall, UROX will usually maintain control of weeds for an 8-month period. In areas of lighter rainfall, control may remain effective for as long as 18 months after a single application.

Effects are cumulative! UROX tends to build increasing soil sterility. Its herbicidal action can thus be extended from one year to the next with small booster doses. As smaller and smaller amounts are used over a period of time, you realize substantial savings.

Amazingly effective! Granular UROX is a "root-seeker." Apply it to dense vegetation or heavy top growth—the granules roll off leaves onto the ground, where killing ingredients penetrate the soil and are absorbed by plant roots. Also, UROX controls so many different, stubborn weeds that there's no need for separate herbicidal treatments. UROX does the *entire* job!

You get fast results! You can see control in as little as 10 to 14 days.

Cuts labor costs, too! Fewer applications . . . no mixing . . . cumulative effects—they add up to significantly lower costs. What's more, you can apply UROX in the winter, when many maintenance crews are idle.

Get the whole story! Write today for our new full-color UROX folder, "Candidly Speaking." You'll see the unretouched, candid-camera evidence of UROX's effectiveness in many widely separated geographical areas, many different climatic conditions. We'll be glad to send you your free copy on request.

Allied Chemical

GENERAL CHEMICAL DIVISION
40 Rector Street, New York 6, N. Y.

Supply Trade News

ALLIS-CHALMERS—N. K. Helding, assistant construction machinery sales manager at Columbus, has been transferred to the Syracuse (N. Y.) branch.

ARCAIR COMPANY—These recent changes have occurred in this company's headquarters at Lancaster, Ohio, due to its expansion program: **Elmer Lehmkuhl** has been appointed sales manager of the company's Eastern division and will be responsible for the marketing and sales of all Arcair products in that area; **Martin Boyer** has been appointed sales promotion and advertising manager; **Durward B. Vaught** has been appointed field representative in Virginia, Kentucky and southern West Virginia in addition to the other southern states which comprise his sales district.

A. M. Byers Company—Robert J. Kurtz, Jr., has been appointed a field service engineer at this company's Pittsburgh Division office, according to an announcement by **R. I. Enzian,** general manager of 4-D wrought iron sales. **John H. Ingalls** has been appointed a field service engineer at the company's Boston Division office according to an announcement by **A. S. Chalfant,** vice president-sales.

The following have been named distributors of the 4-D wrought iron pipe: Ohio Pipe & Supply Co., 14615 Lorraine avenue, Cleveland, Ohio; Springer & Schmalz Supply, Inc., Utica, N. Y., and Traverse City Iron Works, Traverse City, Mich.

DUFF-NORTON COMPANY—A. M. Kelly, product manager of this company's Coffing Hoist division in Danville, Ill., has been promoted to district sales manager with headquarters at San Francisco. Mr. Kelly will be responsible for sales activities in the general industrial field for the company's Jack division and the Coffing Hoist division in California from the Sacramento Valley south.

FOUR WHEEL DRIVE AUTO COMPANY—Formation of a dealer network which will sell this company's heavy-duty trucks and other specialized vehicles exclusively to the railroad market has been announced by **G. F. DeCoursin,** vice-president in charge of marketing. The network covers all major railroads in the United States and Canada and represents a major effort by this company to capture a bigger share of the growing railroad market for off-track equipment. Dealers are located in seven major U. S. rail centers and in one Canadian center as follows: Caesar Baldassari, San Francisco; R. A. Corley, Newark, N. J.; Clarence Gush, St. Louis, Mo.; T. C. Johnson Company, Cleveland, Ohio; Missco Transportation, Inc., Chicago; Roth Railway Supply Company, Omaha, Neb.; Robert J. Wylie Company, St. Paul, Minn., and Mellville Machinery Co., Ltd., Montreal, Que.

KOEHRING—The following appointments have been announced by **J. E. Chadwick,** sales vice-president: **K. R. Chandler,** assistant sales manager, has been promoted to the newly created position of assistant vice-president of sales. Mr. Chandler will have overall supervision of the sales office, parts department, service department, sales promotion and new product activities. **William B. Dickerson** has been appointed to the position of sales manager. He will direct external field sales activities in the United States dealing with Koehring cranes, excavators, pavers and concrete finishing equipment, the "Dumptor" and the "Mud-Jack." He will also be responsible for all field sales personnel.

INTERNATIONAL HARVESTER—P. D. Evans, assistant sales manager of the Western Region of this company's construction equip-

K. P. Chandler
Koehring

W. B. Dickerson
Koehring

This means NIGHT WORK!

NEW SAVE-U-LITE EMERGENCY TORCH!

... And your *Save-U-Lite* Emergency Torch is ready for instant use!

Save-U-Lite gives you strong, bright light over a wide area and lets emergency work on wrecks, tunnels, wash-outs, tracks, and maintenance continue at night. It works without batteries or generators and therefore needs no wires.

The inexpensive Save-U-Lite is simple to operate... Put it in a container of water. It generates acetylene gas which you light with a match. Result: bright, safe light over a wide area. And it operates in snow-rain-wind and zero weather.

Keep a supply on hand at strategic locations where they can be reached quickly ... you'll avoid costly delays in an emergency. Get detailed information now. Write, wire, or phone:

THE AUTOMATIC LITE CO.

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you get lighted signs without the cost of lights

Reflective Train Control gives you wayside signs trainmen can see at night in any weather. These bright, bold signs of colorful "Scotchlite" Reflective Sheeting look like lighted signs at night. But they don't cost as much. Your train headlamps light them up for you. You get greater operational safety . . . and lower sign costs, too, because durable RTC signs for your entire system can be easily mass-produced in one central sign shop. No more painting or repainting. Why don't you see how much money the modern, safer RTC signing system can save for your road. See your 3M Representative or write: 3M Company, Dept. FR-19, St. Paul 6, Minn.

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MINNESOTA MINING AND MANUFACTURING COMPANY—where RESEARCH is the key to tomorrow

Supply Trade News (cont'd)

ment division, has been transferred to the division's Eastern Region, succeeding **J. F. McCoy,** who has been transferred to the division's Central Region, according to an announcement by **R. G. Greer,** construction equipment sales manager.

MATISA EQUIPMENT CORPORATION—R. P. Underwood, general sales manager, has been promoted to vice-president and general manager of this company. Mr. Underwood was formerly Midwest sales manager for the Railroad Division of International Telephone & Telegraph Co. and prior to that worked for the Pyle-National Company. In his new position as chief executive he will continue to have the responsibility of his former position of general sales manager of this company.

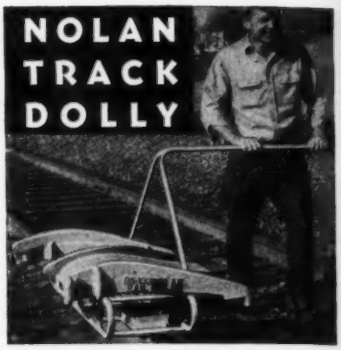
PORTLAND CEMENT ASSOCIATION—Hugh D. Barnes, supervisor of field promotion, has been promoted to assistant vice president. Mr. Barnes will direct and have complete authority and responsibility for all operations of the association's 32 districts and 6 regional offices. **Walter E. Kunze, Jr.,** assistant manager of the Structural and Railways Bureau, has been appointed manager of personnel training, succeeding **Warren G. Burres,** who has been appointed district engineer of the Los Angeles office.

RAILWAY MAINTENANCE CORP. — P. J. Wolf, after January 1, 1959, will represent both **Maintenance Equipment Company** and **Railway Maintenance Corporation,** Pittsburgh, Pa., as Chicago district sales representative. Mr. Wolf was born in Amsterdam, Holland, and came to the United States in 1927. After attending Northwestern University he began his business career with the Western Electric Company, serving in the engineering department. Mr. Wolf joined the Maintenance Equipment Company in 1940. He is a director and secretary of the Association of Track & Structure Suppliers, and is active in the affairs of the Maintenance of Way Club of Chicago.

WHITING CORPORATION—These recent changes have occurred, according to an announcement by **A. M. True,** sales manager: **Harrison Taylor,** assistant district manager of the New York District office, has been promoted to manager of the St. Louis District office, succeeding **Frank P. Walsh,** retired; **Gilbert H. Van Schaik,** sales engineer at Chicago, has been appointed manager of the Chicago District office, succeeding **R. F. Hammond,** retired.

R. P. Underwood
Matisa

P. J. Wolf
RMC-MECO



You can get rails, ties, supplies, tools, rerailers, etc., to the job with money-saving speed and efficiency, when you equip your crews with the Nolan Track Dolly.
Built of tubular high-carbon steel. Extremely strong and serviceable. Operator's handle conveniently placed to assure correct balance and full control of heavy loads.

STANDARD DOLLY

Length	Width	Ht. Above Rail	Weight
50½ in.	15½ in.	6⅛ in.	88 lbs.

INSPECTOR'S DOLLY

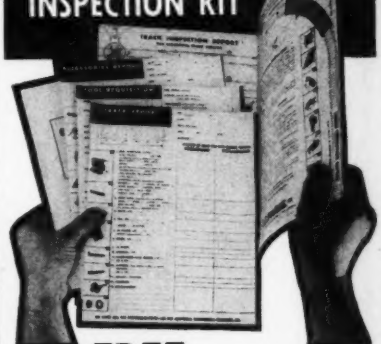
Length	Width	Ht. Above Rail	Weight
36 in.	14 in.	6 in.	60 lbs.

NOLAN TOOL AND SUPPLY CAR

2000 lbs. capacity. All-tubular high-carbon steel construction for safe carrying of ties, rails, supplies, etc. Car breaks conveniently in center into two sections.
Platform size 48" x 45" Ht. above rail 8" Weight 140 lbs. complete.

Write for complete railway supply catalog.
THE NOLAN COMPANY
166 PENNSYLVANIA ST., BOWERSTOWN, OHIO

SEND FOR FOSTER'S TRACK INSPECTION KIT



FREE easy-to-use guide simplifies and improves your industrial customers' track maintenance.

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Pittsburgh 30 Atlanta 8 New York 7
Chicago 4 Houston 2 Los Angeles 5

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Spraying the
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in only 15 weeks.

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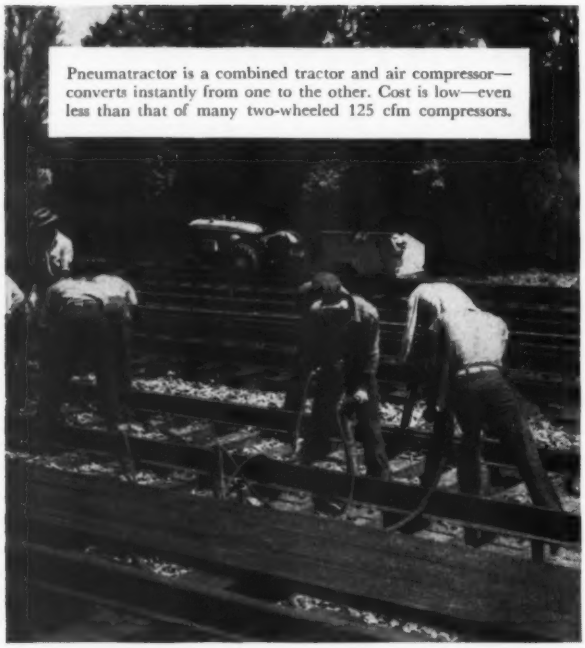
Serving America's Railroads for 70 years.

Rust preventives, detergents and cleaners, pressure cleaning systems, cooling water treatment, de-ionizing and zeolite plants.



Pneumatractor is a combined tractor and air compressor—converts instantly from one to the other. Cost is low—even less than that of many two-wheeled 125 cfm compressors.

WITH SCHRAMM SELF-PROPELLED AIR COMPRESSORS:

YOUR POWER AND MEN MOVE ALONG WITH THE JOB

Maintenance-of-way jobs get done easier, faster and more economically with the Schramm Pneumatractor. It's self-propelled! There's no break, no lost time, while crews knock off and wait for the compressor to be towed or pushed to the next location. And no "work momentum" lost in picking up again. Pneumatractor drives to the job, drives along with the job—delivering power every minute where you need it. No extra equipment. No special operator. You get more efficiency from your crews because of its steady efficiency.

You get more work from each man too, because Pneumatractor operates at full rated power, assuring maximum output of each air tool. You get a full 125 or 250 cfm at 100 psi (enough compressed air to power 12 or 24 tie tampers). In addition, you get *constant* air flow without fluctuating pressure.

Full details of this versatile machine are contained in Bulletin RRP 56. Write for your free copy today.

See the Yellow Pages for Sales, Service and Rental of Schramm Air Compressors.

Schramm, Inc.

MANUFACTURERS OF AIR COMPRESSORS

732 North Garfield Ave. • West Chester, Pa.

Use Pneumatractor to operate tie-tampers, spike or plug drivers, or any other pneumatic tools. It's completely self-powered and self-propelled.

Advertisers In This Issue

Achuff Railway Supply Co. 76
Aeroquip Corporation 72
American Brake Shoe Company, (Railroad Products Div.) . 51
Armco Drainage & Metal Products, Inc. 45
Austin-Western Works, Construction Equipment Div., Baldwin-Lima-Hamilton Corporation 49
Automatic Lite Company 74
Baldwin-Lima-Hamilton Corporation, Austin-Western Works, Construction Equipment Division 49
Bethlehem Steel Company 3
Binks Mfg. Company 63
Bird & Son, Inc. 16
Bogle Company, R. H. 22
Chipman Chemical Co. 47, 61
Colorado Fuel & Iron Corp. 6-7
Cox Company, W. T. 64
Cullen-Friestedt Company 59
Dearborn Chemical Company 77
Fairmont Railway Motors, Inc. 8-9
Foster Company, L. B. 76
Geigy Agricultural Chemicals Co. 4
General Chemical Div., Allied Chemical & Dye Corp. 73
Jackson Vibrators, Inc. 62
Kershaw Mfg. Co. ..... Inside Front Cover
LeTourneau-Westinghouse Company 60
Maintenance Equipment Company 15
Mannix International, Inc. 53
Mid-West Forging & Mfg. Co. 71
Minnesota Mining & Mfg. Company 75
National Lock Washer Co. ..... Inside Back Cover
Nolan Company 76
Nordberg Mfg. Co. 12-13
Orton Crane & Shovel Co. 55
Pettibone Mulliken Corp. 57
P & M Company 18
Pullman-Standard Car Mfg. Company 65
Railway Maintenance Corporation 68, 69
Reade Manufacturing Company, Inc. ..... Back Cover
Republic Creosoting Company 66
Schield-Bantam Co. 39-42
Schramm, Inc. 78
Teleweld, Inc. 59
Unit Rail Anchor Co., (Div. of Hubbard Specialty Products Co.) 21
United States Borax & Chemical Corp., Pacific Coast Borax Company Division 11
Western Railroad Supply Company 67
White Manufacturing Company 70
Wisconsin Motor Corporation 17
Woolery Machine Company 20

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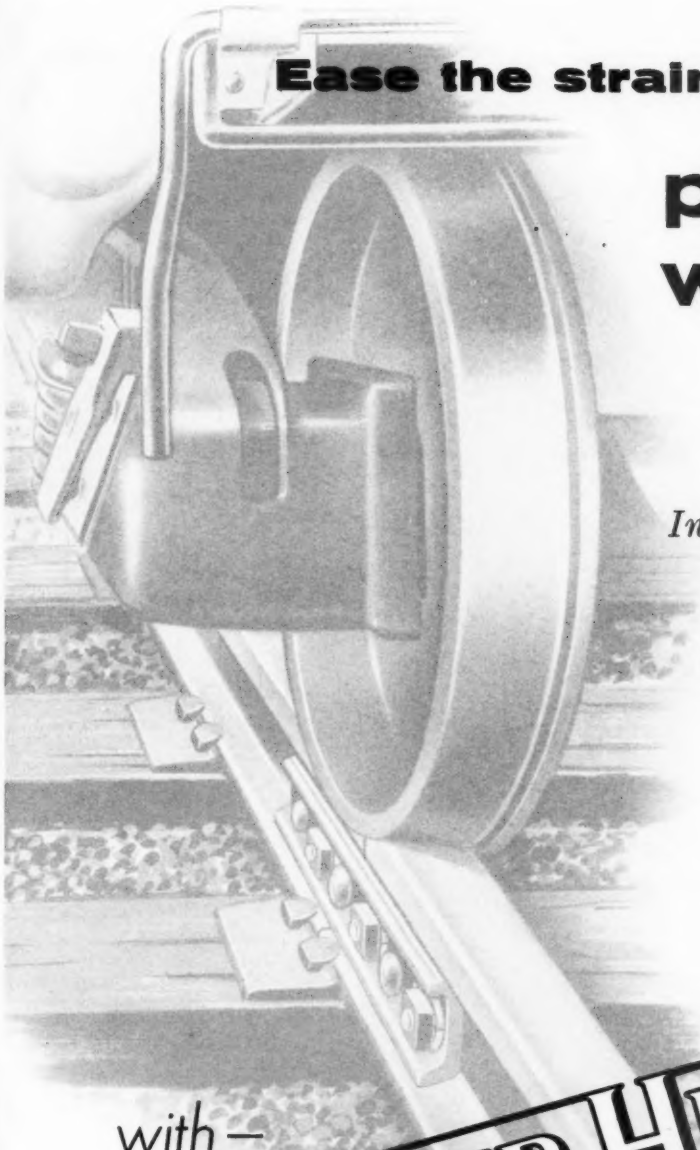

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COMPLETE APPLICATION SERVICE

January 1, 1959

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Central City
U. S. A.

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The Reade Company, with our many years of experience, will be more than glad to discuss with you the many angles involved.

Sincerely yours,

READE MANUFACTURING COMPANY, INC.

Chas. F. Reade

Charles F. Reade
Vice President

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